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AUTHOR Kimonen, Eija; Nevalainen, Raimo
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ABSTRACT

As part of an international comparative study of active learning in seven countries, a case study examined active learning practices of students and teachers in a small rural school in Finland. Small schools have traditionally existed in the sparsely populated Finnish countryside, and 60 percent of Finnish elementary schools have 1-3 teachers. Observation, document analysis, and interviews with teachers, students, and parents were conducted at a rural two-teacher school with 25 students in grades 1-6. The school began changing from a traditional to a more progressive school culture in the late 1980s. The transformation of the school's instructional goals and practices was promoted by constructivist conceptions of learning and by the new curriculum then emerging in Finland. Cooperation among members of the school community became more strongly emphasized. Students worked on projects in small mixed-age groups and cooperatively solved problems related to the task. During cooperation, students had an active role characterized by goal-oriented, self-assessment activity directed by metacognition. Students accessed information through various methods from sources inside and outside the school. The teacher, student, and parents evaluated student work. One teacher in the school sought to continuously develop himself, his teaching practices, and his teaching materials, and has been a change agent influencing school culture and other teachers. The teacher's active learning consisted of independent solving of everyday problems in school and of the active accessing of necessary knowledge and skills. (Contains 145 references and interview questions.) (SV)

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TOWARDS ACTIVE LEARNING

A Case Study on Active Learning in a Small Rural School in Finland

Eija Kimonen and Raimo Nevalainen

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Eija Kimonen and Raimo Nevalainen

TOWARDS ACTIVE LEARNING

A case study on active learning in a small rural school in Finland

Jyväskylä 2002

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Jouko Kari, chairperson
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Cover: Martti Minkkinen
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ABSTRACT

The purpose of the international study initiated by OECD/CERI was to compare the active learning of students and of teachers in the educational practices of seven countries. The aspects of active learning examined included goal setting, task structuring, accessing of information, processing of work and learning, utilizing the outcomes of work and learning, and assessment procedures. The purpose of this case study was to describe, what is meant by active learning in a small rural school in Finland. The object of this study was a rural two-teacher elementary school (grades 1-6) with 25 students. Data were collected during six day visits to the school and the village community and data collection involved tape-recorded interviews, observation, and document analysis. Interviews were carried out with both the class teachers in the school, students (5 in all), parents (4 in all) and the chairperson of the school board. The research data was analyzed by qualitative methods.

The process of change in the case study school from a traditional school culture towards a more progressive culture began during the late 1980s. The transformation of the instructional goals and practices of the school was promoted by constructivist conceptions of knowledge and learning and by the new thinking with regard to the curriculum that emerged in Finland during that time. The educational goals and principles of the teachers in the case study school were reflected in the school's practices of action, where cooperation between the members of the school community began to be more strongly emphasized. Students worked on their projects in small groups made up of students from across the age range, where they interacted with one another and cooperatively solved the problems that emerged from the task. During cooperation students had an active role characterized by goal-oriented, self-assessment activity which was directed by metacognitions. Stress was also laid on independent initiative, a sense of responsibility, and cooperativeness. Students accessed information using a variety of methods and from diverse sources both with in the school and outside it. The outcomes of projects were utilized to some extent. Learning was evaluated both by the teacher and by the student and his or her parents. Methods of work and learning based on active learning have developed many positive features in students, including increased initiative and a growing sense of responsibility.

The teacher in the case study school sought to continuously develop himself, his teaching practices, and his teaching materials. The challenges and problems of the school activity formed the basis for the teacher's learning motivation and encouraged him to develop his own work. The teacher has acted as an agent of change affecting school culture by describing his experiences and observations as an implementor of a school-based curriculum to other teachers. According to the study, the teacher's active learning consists of the independent solving of problems arising from the everyday life of the school, and of the active accessing of knowledge and skills required in the construction of new models of thinking and action.

Key words: Active learning, project method, small rural school, curriculum change, school culture

FOREWORD

This case study is part of a larger Comparative Study on Active Learning -research project initiated by OECD/CERI, the purpose of which is to compare active learning by students and teachers in the teaching and learning practices of selected schools from Australia, Denmark, Finland, Germany, the Netherlands, Spain, the United Kingdom, and the United States. The international comparative study is based on findings obtained from each individual country by means of case studies. The present case study examines what is meant by active learning in a small rural school in Finland.

We would like to express our gratitude to all those who in one way or another contributed to the realization of this study. The research project was initiated during a fieldwork planning meeting in Paris in February 1994. Our special appreciation for their inspiring and creative planning is due to Dr. David Hopkins (University of Cambridge, UK), Professor Günter L. Huber (University of Tübingen, Germany), Professor P. Robert Jan Simons (University of Nijmegen, Netherlands), Professor Robert Slavin (Johns Hopkins University, USA) and Professor David Stern, Principal Administrator (OECD). During the course of our research we had the opportunity of discussing the methodological approaches of qualitative research with Dr. Rosemary Webb and Dr. Graham Vulliamy (University of York, UK), to whom we would like to express our sincere thanks. We are very grateful to Professor Robert Slavin and Associate Professor Viljo Kohonen (University of Tampere) for the written evaluation of the study. The research work was carried out at the Teacher Education Department of the University of Jyväskylä. We would like to extend our thanks to Associate Professor Seppo Hämäläinen, the Head of the Teacher Education Department and to Professor Jouko Kari for the encouragement we received during all phases of our research work.

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Jyväskylä, February 1995

Eija Kimonen Raimo Nevalainen

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1 INTRODUCTION

1.1 The purpose and aims of the study

This case study is part of the Comparative study of active learning initiated by the Organization for Economic Cooperation and Development (OECD/CERI). The purpose of the project is to explore students' and teachers' active learning in the countries under study.

The purpose of this study is to describe, what is meant by active learning in a small rural school in Finland. The study attempts to describe

- active learning for students
- active learning for teachers and
- the relationship between active learning for students and active learning for teachers.

The aim is to investigate the context, resources and processes of a small rural school as comprehensively as possible.

1.2 The national educational context

1.2.1 Curriculum reform in Finland

The school system does not merely seek to adapt to ongoing changes in today's world, it wants to play an active part in the development process. This is the basic principle behind the curriculum reform of the comprehensive school which took place in Finland during the autumn of 1994. The new school is described as flexible, analytical and thoroughgoing and its main objective is to encourage children to learn how to learn. Future schools will be expected to produce intellectually curious citizens capable of posing critical questions and finding a wide variety of answers. The reforms allow each individual school to draw up its own curriculum on the

basis of general guidelines confirmed by the National Board of Education. (Elo 1994, 70.)

The development of curriculum reform in Finnish municipalities actually began in the middle of the 1980s, and the first curricula for individual schools were written during the early 1990s. The new curriculum which allows schools to focus on local features encourages teachers to broaden their teaching and to take local conditions into consideration. The local curriculum is defined here as a curriculum that is applied in a municipality or an individual school where the starting point involves making the students familiar with the local environment and related problems, with the economic, industrial and cultural life, and with needs of their own community (cf. Arajärvi & Aalto-Setälä 1993, 66-67; Pirhonen 1993, 46-47).

According to the Fundamentals of the Comprehensive School Curriculum (1985, 1994), the school should take active responsibility for the development of the local area and for activities which enrich its cultural life. According to the Fundamentals of the Comprehensive School Curriculum (1985) the writing of a local curriculum should involve the following principles:

- The school should take an active responsibility for the development of the local area and its cultural life.
- The school should interact closely with the culture, industry and environment of the local area.
- The starting point for teaching should be focused on the students' experience.
- Students' self-esteem should be strengthened and students should be made aware of belonging to a community that is valuable and whose culture is respected.
- Schools vary and their uniqueness is influenced, among other things, by the school's own traditions, environment and the students' home backgrounds.

(Peruskoulun opetussuunnitelman perusteet 1985, 19.)

According to the Fundamentals of the Comprehensive School Curriculum (1994), which provides guidelines for curriculum development, the school's modus operandi, tasks and distinctive characteristics are to be described in the local, school-based curriculum. The objectives and content of the topic units, school subjects as well as integrated subjects are defined according to the guidelines set out in the national curriculum. Teaching methods and ways of working are also covered. All members of the school community including students' parents and other people active in the functioning of the school, can collaborate in the writing of the curriculum. The process of writing the curriculum should be both active and continuous. The aim is to change the school into a learning center, which is in close contact with interest groups from the local community. (Peruskoulun opetussuunnitelman perusteet 1994, 9-10, 12, 15-16.)

The new Finnish curriculum approach is in accordance with the characteristics describing the current conception of learning. In the new curriculum the student is seen as an active acquirer of information and creator of interpretations. (Atjonen 1994, 111-112, 118.) (TABLE 1.)

TABLE 1. The new curriculum and learning conception (Atjonen 1994, 111-112)

Teacher activity as represented by the new curriculum conception	Student activity as represented by the new learning conception
- teacher's own curriculum or work plan	- individuality, nonconformity
- meaningfulness, motivation	- meaningfulness, motivation
- activeness, interpretativeness	- activeness, participation
- commitment	- experiential approach
- collaboration, team spirit	- social skills
- utilization of teacher expertise	- utilization of knowledge basis
- readiness to implement the curriculum	- readiness to acquire knowledge
- curriculum entity	- information entities
- teacher responsibility	- learner responsibility
- school development plan	- learning environment

1.2.2 Small rural schools in Finland

Small schools have traditionally existed in the sparsely-populated Finnish countryside. The number of small schools has varied according to social, cultural and economic conditions. The quantitative development of schools has been connected to both social and educational policy which regulates the number of schools. (Laukkanen, Muhonen, Ruuhijärvi, Similä & Toivonen 1986, 19, 28.) Since the 1960s the network of schools has clearly been in decline (Kivinen 1988, 265). Altogether 241 elementary schools were closed during the 1980s (Koulutus. Education in Finland 1991, 33). The rate of school closure increased still further between 1990 to 1993, when a total of 250 lower level comprehensive schools were closed down. From 1993 until 1995, another 400 schools are scheduled for closure, according to estimates from the National Board of Education. The most significant reason for the closure of schools has been the dramatic decrease in the number of students. During recent years economic factors have also become significant, in the decision to close schools. (Tilastotietoja peruskouluasteen kouluista 1994, 3-4.)

At present 60 per cent (= 2239) of Finnish elementary schools (3729 in all) are small schools with 1-3 teacher posts. During the school year 1992-1993 there were 50 one-teacher elementary schools (1.3 per cent of the elementary schools), 1352 (36.3 per cent) two-teacher schools and 837 (22.4 per cent) three-teacher schools. (Tilastotietoja peruskouluasteen kouluista 1994, 8.)

The qualitative development of a small rural school can be studied from the point of view of the school's context, resources, processes and products. In Finland attempts have been made to solve the contextual problems of small rural schools by enriching the life of the surrounding villages and developing their activities. An important developmental goal in the countryside is to strengthen the interaction between the school and the surrounding community. The cultural, material and economic resources of small schools have been developed by training teachers, repairing school buildings, writing teaching material which offers differentiation in combined grades, increasing the financial support for school transport and enhancing resources by applying the time resource quota system in each individual school.

Attempts have been made to solve the process-based problems related to teaching, by developing students' independent working skills, applying the period system in teaching and by implementing outdoor education. Furthermore, the curricula of combined grades have been developed, for example, by unifying the teaching of different grades and by emphasizing the use of local subject material in teaching. An important part has been played by increased cooperation between the school and the home, and through the collaboration between small schools. (Kalaoja 1990a, 93-110; 1990b, 1-3, 91-102.)

There has been a long traditions of collaboration between people living in the country. Many official and administrative districts have been formed on the basis of villages, such as school- and post districts and districts for municipal planning and voting. Such cooperation has often centered on rural schools. (Hautamäki 1989, 7-8.)

The school has a stimulating effect on the village community socially, culturally, and spiritually. Activities arranged in schools unite the village and its inhabitants. The activeness of the village is reflected in the activeness of the school. (Kalaoja 1988a, 149.) According to Kalaoja (1988a, 128-132), about 40 per cent (= 56) of small school teachers in the province of Oulu considered the school as the center of cultural, leisure-time and community activities in the village. According to some teachers, the school also created the identity of the village and a cooperative spirit.

1.3 The research questions

The study examines the active learning of students and teachers in a small rural school. The main problem of this case study is

1. What is meant by active learning in a small rural school?

The following two sub-problems of the study are derived this question:

1.1 What is meant by active learning for students in a small rural school?

The following questions are related to the first sub-problem:

- How are students involved in goal setting?
- What kind of task structure prevails in active learning?
- How is information accessed in active learning?
- What is the process of work and learning like?
- How are the outcomes of work and learning utilized?
- How is the assessment of learning and the learning process carried out?

1.2 What is meant by active learning for teachers in a small rural school?

The following questions are related to the second sub-problem:

- How are the goals of the learning process set?
- What kind of task structure prevails in active learning?
- How is information accessed in active learning?
- What is the process of work and learning like?
- How are the outcomes of work and learning utilized?
- How is the assessment of learning and the learning process carried out?

1.4 Research method

1.4.1 The case study approach

This study examines active learning by means of a qualitative case study. The case study approach offers a specific way of collecting, organizing and analyzing data, in order to gather comprehensive, systematic and detailed information about the subject under study (Patton 1990, 384; cf. Webb 1994, 2). According to Yin (1989, 23), a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context and in which multiple sources of evidence are used.

According to Hitchcock and Hughes (1989, 214), a case study, as a product of social or educational research, is likely to have the following characteristics:

1. A concern with offering a rich and vivid description of events within the case.
2. A chronological narrative or description of events within the case being studied and leading up to the case in question.
3. An internal debate between the description of events and the analysis of events described.
4. A focus upon particular individual actors or groups of actors and on their observations and accounts.
5. A focus upon particular individuals and particular events within the case.
6. The integral involvement of the researcher in the case.
7. A particular mode of presentation that is able to encompass the parameters of the case.

It is typical of a case study that, as the research work progresses, problem setting on the basis of the researchers' observations and theorizing gradually becomes more precise. Thus the research approach is simultaneously inductive and deductive. The research material is usually qualitative, although it is possible to refer in the study to statistical information from other evaluation studies. (Syrjälä & Numminen 1988, 5-11; cf. Burgess 1993, 222-226.)

As regards the present study, a case study approach offers several methodological benefits. It allows the researcher to discuss the school's activities in detail with teachers, students, parents and other people who influence the operation of the school community. Furthermore, through observations that take place in a natural school environment, the researcher can verify how the policies recorded in the school curriculum are realized in practice. It is also possible to utilize the results of a case study in teachers' basic and in-service training, when orientating them with regard to the implementation of a new school-based curriculum. Finally, the potential weaknesses and defects of case studies are discussed in the chapter dealing with the validity and credibility of study.

1.4.2 Data collection techniques

The object of this case study is a rural two-teacher elementary school (grades 1-6) with 25 students. An attempt will be made to examine the views and experiences of all those participating in the activities of the school, as well as their functions in the village school and in the surrounding community. According to the triangulation principle, the same questions will be studied using several methods to ensure that the data obtained complement and validate each other (Patton 1990, 187-188; Vulliamy 1990, 161; Yin 1989, 95-103). Data which included tape recorded interviews, photos and document analyses were collected during six day visits to the school and the village community. Interviews were conducted with the class teachers (2 in all) in the school, students (5 in all), parents (4 in all) and the chairperson of the school board.

1.4.2.1 Interviewing

The purpose of interviewing is to ascertain opinions, ideas and beliefs. Qualitative interviewing is based on the assumption that the perspective of others is meaningful, knowable, and able to be made explicit. The informal conversational interview relies entirely on the spontaneous generation of questions in the natural flow of an interaction. The semi-structured interview is a flexible version of the structured interview. It allows depth to be achieved by providing the opportunity on the part of the interviewer to probe and expand the interviewee's responses. The general interview guide approach involves outlining a set of issues that are to be explored with each respondent before the process of interviewing begins. (Hitchcock & Hughes 1989, 83-88; Patton 1990, 278-281.)

In this case study the interview method included informal conversational interviews, the general interview guide approach and semi-structured interviews. Informal conversational interviews were generally conducted in natural interaction situations, to complement observation. Lists of themes and interview forms containing open questions were used in the interviews. For the teacher and student

interviews, the different types of interviews were combined, so that all interviewees were presented with the same basic questions but, in addition, in-depth questions were asked regarding certain theme areas (cf. Appendices 1-3). Parent interviews were conducted by using the general interview guide approach. (Cf. Syrjälä & Numminen 1988, 99-102; Hitchcock & Hughes 1989, 88-93.)

In the present study the head teacher, class teacher, students, their parents and the chairperson of the school board were interviewed as follows:

9.4.1994 interviews with the head teacher and class teacher
25.4.1994 interview with the head teacher
26.4.1994 interview with the head teacher and student interviews (grades 3, 4, 5 and 6)
27.4.1994 interview with the chairperson of the school board
28.4.1994 interview with the head teacher and class teacher, interview with a student (grade 1) and parent interviews
29.4.1994 interview with the head teacher and class teacher and parent interviews

Key informants were interviewed in the study, since they could be expected to provide particular knowledge of the activities in the small rural school (cf. Patton 1990, 263). All interviews were recorded.

1.4.2.2 Observation

To understand fully the complexities of many situations, direct participation in and observation of the phenomenon of interest is an appropriate research method. The purpose of observational analysis is to take the reader into the setting that was observed. The data from observations consists of detailed descriptions of people's activities, behaviors, actions, and covers a wide range of interpersonal interactions and organizational processes that are part of observable human experience. (Patton 1990, 10, 25-26.) During this case study the initial visit to the school was made on 9.4.1994, when the timetable for the research program was agreed upon with the teachers. The study aimed to observe the entire cooperative learning and teaching

process connected with students' project work. Teaching was studied intensively during one school week (25.-29.4.1994). In addition, other periods of school activities were observed, including breaks, school lunches and visits to the mobile library. The meeting of the school board and the homes of both teachers were also visited. The aim was to focus observation on the most important aspects of active learning that emerged during the research process. During the observation sessions notes were taken and the teacher's instructions and student group discussions were recorded. The events of each school day were followed by discussions between the researchers. The observations were also recorded in the computer-based CERI-Programmed Observation Protocol (CERI-POP) created by Günter Huber, with the aim of structuring the data collection during the teaching process and facilitating the comparability of the results of case studies conducted in different countries.

1.4.2.3 Document analysis

The data gathered by interviews and observation were complemented by the collection of various documents from the school. The following written materials were used for the study:

- the school curricula for 1992 and 1994
- the school working plans
- the school budget
- students' personal study-books which contain evaluations of school work written by teachers, students and parents
- the plans for study trips and school camps
- school bulletins for homes
- parent enquiries about school work
- students' group work products
- students' diaries during the follow-up week
- newspaper articles about the school
- demographic statistics concerning the municipality.

Photographs were taken of students and teachers engaged in the different phases of cooperative project work and of the teaching premises, equipment and materials.

1.4.3 The selection of a case study school

Qualitative research does not proceed from assumptions related to statistical probability and generalization. Therefore the selection of sites must also proceed from a set of assumptions very different from those which guide generalizability or probability assessments about any given population. (Tierney & Lincoln 1994, 115.) According to Patton (1990, 169), qualitative inquiry typically focuses in depth on relatively small samples, even single cases, selected purposefully. The logic and power of purposeful sampling lies in selecting information-rich cases, which yield data that is of central importance to the research.

The selection of the object of this case study was motivated by a need to describe in detail the way active learning is manifested in a small Finnish rural school. In addition to their educational function small schools are seen as maintaining the spiritual and material vitality of the village community. This special aspect of small schools which distinguishes them from urban schools influenced the choice of research object. Furthermore, the following factors directed the selection of the case study object:

- meaningful and interesting educational objectives, methods and situations, related to active learning, were assumed to emerge in the school practice
- the school was assumed to provide cooperative learning situations based on student activeness
- the school had been trying out its own integrated curriculum for two years
- the teachers in the school had described their experiences of implementing the new curriculum in newspapers and during teachers' in-service training sessions

- the teachers and community members were willing to participate in the study
- the public school supervisor in the provincial government recommended the school as an object for the case study.

1.4.4 Data analysis

Analysis is the process of bringing order to, and exploring the meaning of data by identifying key issues, themes, patterns and categories. The aim is to generate ideas, hypotheses, theories, models and typologies from data. The process of analysis begins while the data are being collected which enables the researcher to focus progressively on important emerging issues and where necessary to modify or add to original research questions. (Webb 1994, 8-9.)

With inductive analysis of research data, description and interpretation form an integrated entity. The aim is to develop grounded theory. The data are systematically and intensively analyzed by constant comparison, collection and coding. (Glaser & Strauss 1967, 5-6; Hitchcock & Hughes 1989, 97-98; Strauss 1987, 22-23; Patton 1990, 44-46, 390.) According to Webb (1994, 9-10), the following phases can be distinguished in the process of analysing qualitative data:

1. In order to derive an overall picture of the evidence, the transcribed data obtained from interviews and observations are read and grouped according to the research questions.
2. Issues, themes and recurring patterns are looked for in the data as a means of forming categories. Also differences and similarities in the opinions and actions of research participants are looked for.
3. The rules for categorizing the data are made explicit and their consistency in the interpretation is checked, for example, by comparing the codings made by other researchers participating in the study.
4. Interpretations for the findings are suggested and from these hypotheses or grounded theories are developed.

5. Exceptions or negative instances are sought which will help to refine or disprove theories emerging from the data.
6. The analysis is strengthened and deepened by comparing the research data with previously published research covering the same issues.

1.4.5 The validity and credibility of analysis

The validation of data concerns the processes whereby researchers can both have confidence in their own analyses and can present these in ways which can be independently checked by others (Webb 1994, 10). According to Patton (1990, 461), the credibility issues for qualitative inquiry rest on the following three distinct but related inquiry elements:

1. Rigorous techniques and methods for gathering high-quality data that is carefully analyzed, with attention to issues of validity, reliability and triangulation.
2. The credibility of the researcher, which is dependent on training, experience, track record, status, and presentation of self.
3. Philosophical belief in the phenomenological paradigm, that is, a fundamental appreciation of naturalistic inquiry, qualitative methods, inductive analysis, and holistic thinking.

The most common form of data validation is the use of triangulation (cf. Hitchcock & Hughes 1989, 104-105; Patton 1990, 464-472; Vulliamy 1990, 161; Webb 1994, 10-11). According to Patton (1990, 464), there are basically four kinds of triangulation that contribute to the verification and validation of qualitative analysis:

- Methods triangulation: examining the consistency of findings generated by different data-collection methods.
- Triangulation of sources: examining the consistency of different data sources within the same method.
- Analyst triangulation: using multiple analysts to review findings.

- Theory triangulation: using multiple perspectives or theories to interpret the data.

Following the principles of triangulation, a number of methods were applied in gathering the data for this case study and a series of individuals were interviewed on the same topics. To increase reliability of the study further two researchers with a long experience in teacher training were used to simultaneuously carry out the observations, interviews and their analyses, in order that the consistency of their observations could be used to asses the credibility of the study.

In order to ensure the internal validity of qualitative research, it is essential to examine the researcher's own impact on the information he or she collects from the case study school (cf. Patton 1990, 472-477; Syrjälä & Numminen 1988, 136-137). The researcher's presence at the school alters the normal situation in many ways. This effect is especially accentuated in a small rural school, where visitors are relatively uncommon. Teachers and students may feel self-conscious and ill at ease in front of researchers at the beginning of the study. Teachers may also seek to convey the impression of being good teachers and prepare exemplary lessons. In order to limit these effects, the researchers made several visits to the school and remained there for many school days. Researchers however may also distort his or her observations by identifying him or herself with the people he or she studies or adhere too strongly to his or her prior conceptions. Systematic error and erroneous choices can occur during data collection. The researcher can also make mistakes while analysing the data. (Syrjälä & Numminen 1988, 136-137.) In order to minimize these errors, the research report was sent to the teachers in the case study school, so that they could check the research findings on the basis of their practical experience. (Cf. Syrjälä & Numminen 1988, 135-143; Webb 1994, 11.)

A validation technique built into the analysis stage is the process of saturating categories and searching for negative instances in the data. The researcher rigorously searches the data or collects new data for examples which might modify or disprove emerging ideas and hypotheses until the new data merely reinforce the existing categories. (Webb 1994, 11-12; cf. Patton 1990, 462-464.) In the present study,

negative instances were sought through interviewing parents whose children had adjustment problems or who were critical about the reform of the school's teaching methods.

The external validity of research can be seen in terms of comparability and translatability. According to Goetz and LeCompte (1984, 228-229), comparability refers to the degree to which the components of a study - including the units of analysis, concepts generated, population characteristics, and setting - are sufficiently well described and defined that other researchers can use the results of the study as a basis for comparison with other studies addressing related issues. Translatability, on the other hand, refers to the degree to which the researcher uses theoretical frames, definitions, and research techniques that are accessible to or understood by other researchers in the same or related disciplines. In this study comparability and translatability are essential sub-areas of external validity, because the results of the case study will be compared with other case studies of the OECD/CERI Comparative study of active learning.

2 ACTIVE LEARNING

2.1 The learning process

According to recent conceptions of knowledge, knowledge is constantly changing, and its acquisition and understanding demands personal experience and structuring. These ideas are by no means new outside Finland. American philosophers presented them already at the turn of the century. Thus, the demands for a shift in conceptions of knowledge and learning for the school, which emerged in Finland during the late 1980s, have already long been applied in American education (cf. Kimonen 1992, 10-14). The purpose of the following discussion is to examine the ontological perspectives of the learning process from the viewpoint of pragmatistic thought and the cognitive learning conception.

2.1.1 Reality, experiences, and action

Action, thinking, and knowledge are, according to the pragmatistic view, ways of structuring reality, which, in turn, takes place in connection with immediate experiences. The construction of reality is one of the basic needs of human existence. According to William James (1842-1910), pragmatism is a suitable method for solving questions about reality (James 1963, 23). James examines the essence of reality on an individual basis, starting from personal experiences, feelings, and volition. All reality has a subjective source and origin in man himself. According to James (1891, 295-297), reality refers simply to the way we relate to our emotional and active life. Anything that excites and stimulates our interest is real. James' conception of pragmatism as an instrumental theory of truth is closely connected with this interpretation of the essence of reality. According to James (1963, 28), ideas are true to the extent that they help us to build a satisfactory relationship with the other parts of our experience. The truth of ideas is manifested by their usefulness in

practice. What proves to be good in thinking and action is true. (James 1963, 36, 89, 98.)

In John Dewey's (1859-1952) philosophical thinking, experience forms a central, productive, and integrative factor. According to Dewey (1950, 92-93; 1951, 113), experience is both a tool and a goal in education. Education involves a continuous reconstruction of experiences, which also utilizes earlier experiences and the knowledge cumulated from them. Experiences consist of interaction between inherent activities and the environment. This interaction modifies both the activity and the environment. Experiences cannot, therefore, be given to the student in a pre-processed form. They are formed in the course of the activities.

It is characteristic of children that they are capable of adjusting to new situations through a process of questioning, experimenting and investigating. Activity arouses spontaneous interest and attentiveness in them (Dewey 1953, 10). According to Dewey (1953, 9-11, 131), practical activity teaches a child to take personal responsibility and prepares him or her to face the realities of life. Activity creates work and is connected with it. In connection with different tasks, the child becomes familiar with society and the different ways in which it functions. Practical work helps to make school itself "a genuine form of active community life". The progressive educational approach presented by Dewey emphasizes experimental and creative pedagogy, which, through experience, closes the gap between school work and community activity.

2.1.2 Thinking and knowledge

According to Dewey's view in the areas of epistemology and philosophy of education, the school should be a place of real life activities which are connected with the surrounding society so that a child can analyze and solve problems set by the environment in order to develop his or her thinking. According to Dewey (1950, 192, 401), thinking is a tool by which we can control experience and so adjust ourselves to the outside world. The knowledge generated by this kind of thinking

develops in the course of practical activity, through interaction with the object of knowledge. Man's own practical and aesthetic interests are the bases of his search for knowledge (James 1891, 344). Thus knowledge that has evolved from action can be seen as subjective knowledge, which becomes realized over and over again in the meaning structures of a new interpreter - in the experienced world of the interpreter. Knowledge often also includes skills. Alternatively, even minor skills presuppose knowledge (Voutilainen, Mehtäläinen & Niiniluoto 1989, 26). According to Dewey (1953, 132), action not only promotes knowledge and skills, but also attitudes and values, since action combines also a mental and moral awareness with performance.

In outlining the development of independent thought, Dewey stresses the importance of reflective thinking which is focused on man's own consciousness. According to Dewey (1933, 3, 9), reflective thinking connected with an experience means effective and detailed consideration of beliefs and expectations. From the point of view of learning, reflection is a superordinate concept for those cognitive and affective activities in which an individual examines his experiences in order to achieve a new level of understanding (Boud, Keogh & Walker 1985, 19). Dewey developed a five-phase model for reflective thinking. The first phase involves suggestion, where the mind leaps forward to a possible solution. The phase of suggestion is followed by the intellectualization of the difficulty that has been experienced into a problem to be solved. The third phase involves the use of one suggestion after another as a leading idea, or hypothesis, to initiate and guide observation and other operations involved in the collection of factual material. The fourth step is the mental elaboration of the idea or supposition, in other words, reasoning. The last phase involves the testing the hypothesis by overt or imaginative action. (Dewey 1933, 107.)

Because learning process in active learning usually proceeds inductively, the principles of inductive reasoning are applied with regard to thinking. Induction refers to scientific reasoning, which advances logically from details to generalizations. The aim is to arrange the learning material into such a form that it is possible to construct meaningful classifications, and to ascertain its properties and dimensions. The purpose is to find a general model or characteristic which

effectively combines the different parts of the material and represents its key characteristics as well as possible. Descriptive induction seeks to describe phenomena in the form and order that they appear in reality. Empirical induction, based on a specific body of material, tries also to explain the connections between different phenomena. In theoretical induction, on the other hand, the material is used to create hypotheses which are assumed to be valid also and which can be used with regard to other corresponding materials. (Grönfors 1982, 30-32; cf. also Peirce 1960c, 103, 105; 1966, 126-136.)

The basis of knowledge acquired by the inductive teaching method consists, according to Taba (1966, 34-36; 1967, 92, 101, 109), of individual observations, conclusions drawn from them, and consequent generalizations and perception of regularities. The task of the students is first to collect material individually. During the concept formation phase, the students then proceed to list, group, and classify the information. During the interpretation phase, they attempt to identify details, explain facts, and draw conclusions. Finally, the students endeavour to apply the principles they have found by making prognoses and hypotheses and then try to defend and verify them.

According to Charles Sanders Peirce (1839-1914), thinking is based on signs or concepts which are formed through experience (Peirce 1960d, 151-152). The meanings of concepts can be solved by examining their practical results. In this way man's conscious thoughts and beliefs develop in close connection with action. (Peirce 1960a, 230; 1960b, 258.) The starting point for the opening of meaning consists, according to Ludwig Wittgenstein (1889-1951), of common language games and forms of life in which we are members. Man's world is not created by things or facts in the external or internal world. Human life and reality are constructed and shaped, primarily, by people's real activity in its different forms. Language is an instrument whose expressions are used in activity. Thought can live and become renewed only in connection with activity and the problems generated by it. It is not possible to solve the question about the meaning of linguistic expression only by means of thought or internal intention. We must also take into consideration the practical activity of language users and the goals and problems which reflect it.

Meaning and language are fundamentally related to one another. They are constructed together through concrete activity. (Aaltola 1989, 180, 226-227, 232.)

2.1.3 The construction and regulation of knowledge

Man's cognitive structure constitutes the essential factor in learning and teaching. According to Ausubel (1968, 131), cognitive structure refers to significant substantive and organizational properties of the learner's total knowledge. Cognitive structure is also understood as a framework of hierarchically organized concepts and propositions, which are the individual's representations of sensory experience (Novak 1979, 25, 126; cf. also Ausubel 1968, 506). Active learning is often inventive and meaningful. In discovery learning the learner him/herself must discover the principal content of the learning task before he/she can meaningfully incorporate it into his/her cognitive structure. In meaningful learning, the learner relates the learning task in nonarbitrary, substantive fashion to what he/she already knows. The new experience is assimilated into relevant existing ideas in his/her cognitive structure, and in this way, new experiences become meaningful. During the course of the assimilation process, the established relevant ideas in the cognitive structure are employed. At the same time these anchoring ideas, as they are known, are modified and differentiated, that is, accommodated. (Ausubel, Novak & Hanesian 1978, 24, 27, 125, 127; cf. also Novak 1979, 123-124.)

The anchoring ideas outlined in Ausubel's cognitive learning theory are structurally and functionally comparable to the views of schema presented by Frederic C. Bartlett (1886-1976) as early as in the 1930s (cf. Ausubel et al. 1978, 155; Bartlett 1932, 201-202). According to Neisser (1976, 54-56), the schema represents man's internal pattern of action as well as his pattern for action. Schemes function as the basis for the assimilation of new information as it becomes available at the sensory surfaces. They direct the acquisition of knowledge. Schemes are also modified and changed by experience and new information. Schemes imply all the explicit knowledge an individual possesses about the physical, social, or mental world (Alexander, Schallert & Hare 1991, 333, 335).

Metacognition refers to the understanding of one's own cognitive functioning and a readiness for its goal-oriented regulation (von Wright 1987, 316). Metacognitive skills are conscious choices of strategies. This kind of activity directs, evaluates, and corrects a person's own learning. Metacognitions are also in evidence when an individual consciously regulates, observes, and directs his/her own activity in different social situations. When we speak of learning to learn, we are actually referring to the acquisition of metacognitive skills, in other words, to the student's awareness of what knowledge or skills are appropriate or inappropriate for the performance of a task, for understanding things, or solving problems. (Kuusinen & Korkiakangas 1991, 50-51; cf. also Wellman 1985, 1; Yussen 1985, 253.)

The use and exercise of metacognitive readinesses are, according to Rauste-von Wright and von Wright (1991, 277), essential in the reflective teaching and learning process. At the same time, the learner's active role is stressed: the learner must experientially perceive him/herself as an actor. The pedagogical challenge thus involves motivating students to adopt goals that are characteristic of reflective activity. On the one hand, it is important to understand what one is learning and doing, and, on the other, to see learning as a tool for "controlling one's own activity and the whole world".

Man's knowledge is constructed of explicit knowledge and tacit knowledge (FIGURE 1). Explicit knowledge can be further divided into conceptual and metacognitive knowledge. Conceptual knowledge refers to knowledge about content and knowledge about language and about the way it is used in different situations. Metacognitive knowledge contains information about the learner him/herself and of the learning task, as well as knowledge about the plans, goals, and strategies connected with the learning process. In addition to such explicit knowledge, man's activity is also directed by unspecified and unconscious knowledge, tacit knowledge. Such tacit sociocultural knowledge functions as a pervasive filter through which all experiences and understandings must pass. Sociocultural knowledge reflects the attitudes and beliefs of the social group and culture of which the individual is a member. The detailed situation models of an individual's physical, social and mental world, and the models of the micro- and

macrostructures of language are constructed in interaction with existing knowledge and the external world. By means of this construction, man becomes linked to the external world through his/her own experience. (Alexander et al. 1991, 323-333.)

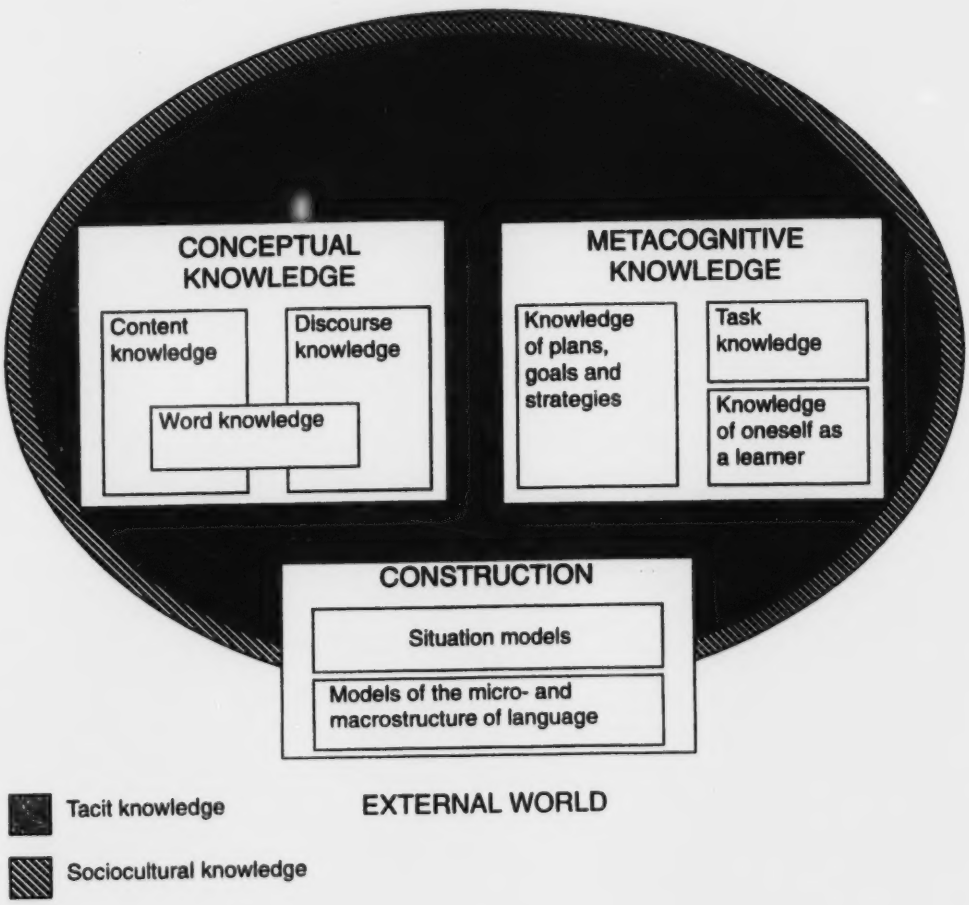

FIGURE 1. The structuring and regulation of knowledge (Alexander et al. 1991, 324, 327, 328, 330, 332-333)

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The image we have of the world around us is never ready or complete. Reality in our world is characterized by the uncontrollability of developments and situations. One of the Finnish action research projects, the Environment and school initiatives project carried out by Kurtakko (1989, 1-2, 55-63; 1990, 82-86) emphasizes the need to teach students about reality on an experiential basis. According to the principles which direct the teaching practice, students should be in direct interaction with the objects of study (experience and action). No limitations are set with regard to the conclusions and interpretations made on the basis of this interaction. Instead, the students are encouraged to consider the results of the interaction without any anticipations about the end result (reflection). On the basis of the conclusions drawn, students should try to change their own activity patterns and seek to influence their environment (knowledge). (Cf. also Kurtakko & Izadi 1991, 48-53.) The aim of the learning process is to develop thinking through experiences shaped by action. The goal is to assist students in developing awareness, knowledge, and skills, by means of which they can control their own lives.

2.1.4 A definition of the learning process

In the above discussion, we have tried to comprehensively examine the learning process from the perspectives of pragmatistic thought and according to the conception of cognitive learning. Figure 2 summarizes the essential factors - action, thinking and knowledge - and their interrelationships. The learning experience is connected with goal-oriented activity where, in connection with solving problem situations, knowledge, skills, attitudes, and values, for example, are created. Such reflective thinking is then used to evaluate the meanings of the concepts which are linked to the student's cognitive structure and which concurrently help to develop his/her metacognitions. These metacognitions, in turn, assist in organizing reality during a new learning experience. (Kimonen & Nevalainen 1993-94, 22.)

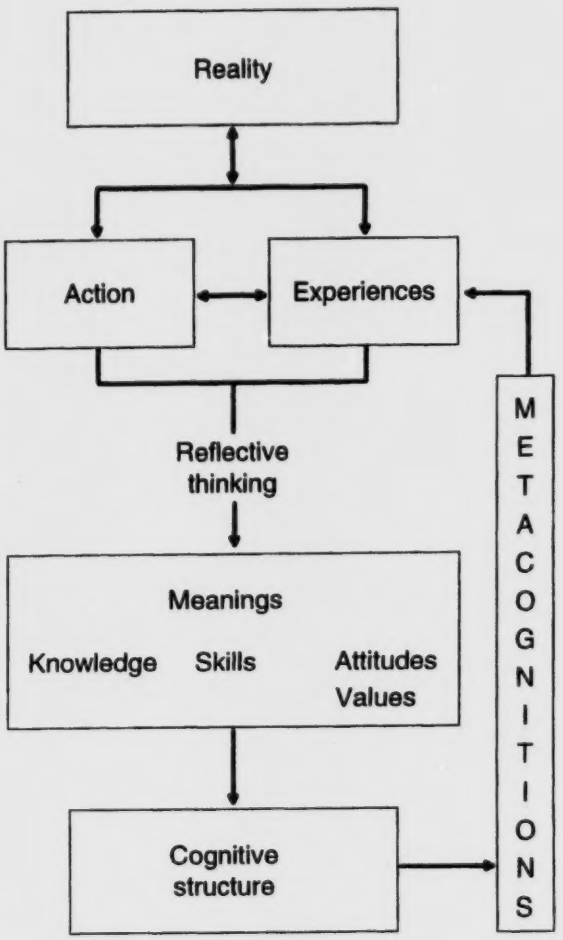

FIGURE 2. Action, thinking, and knowledge as factors connected with the learning process (Kimonen & Nevalainen 1993-94, 22)

2.2 Active learning - a family of concepts

In the preceding discussion we have dealt with the learning process from the perspectives of pragmatistic thought and in terms of the cognitive learning conception. The purpose of the following section of this chapter is to examine the

concept of active learning and its instructional implications from the view of the constructivist learning conception, the teacher and student roles, as well as the methods of project work and cooperative learning.

2.2.1 Defining active learning

Kyriacou (1992a, 310) described active learning as the use of learning activities in which students are given a marked degree of ownership and control over the learning tasks, where the learning experience is open-ended rather than tightly predetermined, and where the student is able to actively participate and shape the learning experience. Active learning refers to a family of concepts. (Cf. Kyriacou & Marshall 1989, 1-5; Kyriacou, Brown & Constable 1990, 1; Page 1990, 72-74.) Kyriacou et al. (1990, 1-2) identified five concepts which underlie active learning:

1. The use of concrete materials and direct experience. The learning experience will be more active in as much as students engage with real as opposed to surrogate or abstract representations of experience.
2. The use of investigative or problem oriented techniques. Learning will be more active (a) when the material to be learned is in the form of problems to solve or answers to be discovered, and (b) where the problem is the property of students' themselves (cf. Watts 1991, 91-94).
3. The use of small group work. Small group work involves small groups working collaboratively. The essence of activity within group work is interaction between students as part of the learning process (cf. Johnson, Johnson & Holubeck 1990, 4; Kagan 1985, 67; Slavin 1993, 1).
4. Student ownership of the learning process or task. Examples of student choice or even empowerment may be found in both curriculum decision making and classroom management. The term active can be taken to relate to the student's active involvement with decisions (cf. Watts 1991, 82).

5. Personal focus and relevance of the learning process or task. This refers to enlarging students' understanding of themselves, their feelings, their development and state of being, as an important aim of learning. This dimension relates to the notion of experiential learning and personal development.

According to Page (1990, 72-74), an active learning model involves the student being mentally and/or physically active. The student conducts his/her own learning, discovers his/her own answers, solutions, concepts and relationships, and creates his/her own interpretations. The importance of students being actively involved in carrying out tasks in relation to their environments is also emphasized. These activities can take several forms such as working with objects, working on projects or being involved in investigative inquiry or in reflective discussion. Furthermore, the active in active learning also refers to students being actively involved in planning and the selection of their educational experiences. The term active learning, however, covers more than a method of learning. It also describes the form or kind of learning that results from that method of learning. Through the method of active learning the students acquire the ability to engage in reflective thinking - that is to solve problems by defining the problem, by gathering, interpreting, organizing, categorizing and analysing data, by forming and testing hypotheses and by drawing conclusions.

2.2.2 The constructivist conception of learning

Active learning is based on the constructivist conception of learning. Constructivism is not a single theory but a variety of theories, an approach or a paradigm. However, there are some common assumptions in all of them. (Cf. Leino 1993, 1.) According to the constructivist learning conception, advanced thinking skills and cognitive structures are acquired, when the learner adopts an independent, active and processing approach to building up his/her knowledge and consciousness (Olkinuora 1994, 65). According to von Wright (1993, 30-31), the learning process in the constructivist learning conception is consistent and based on modern scientific

views, but its application to teaching is demanding. The following Table outlines some of the instructional implications connected with the conception of constructivist learning (cf. Driver 1988, 138; Leino 1993, 4-5; Magoon 1977, 667-686; Olkinuora 1994, 65-66; von Wright 1993, 19-30, 38) (TABLE 2).

TABLE 2. Instructional implications of the constructivist conception of learning

Aspect	Instructional implication
Previous knowledge	1. The human being can learn only in respect to his/her previous knowledge which has important consequences with regard to how he/she learns and acts.
Activeness	2. Learning is considered to involve an active process on part of the learner.
Meaning-fulness	3. Learning involves the construction of meaning and often takes place through interpersonal negotiation.
Self-regu-lation	4. Learning is self-regulated and thus based on the learner's metacognitive consciousness, among other things
Inten-tionality	5. Learners are seen as purposive and ultimately responsible for their own learning.
	6 Intentional learning is a skill that can be learned.
Understand-ing	7. Understanding is usually a prerequisite for adequate knowledge construction.
Context-dependence	8. Learning is always situated, context-dependent, and thus learning situations and arrangements are linked to authentic, real-life social and physical conditions.
Cooperation	9. Social interaction plays a central role in learning, and thus guidance and feedback from teacher or friend enhances learning
	10. The human being has developed a capacity for developing knowledge by organizing complexity rapidly, attending to the meanings of complex communications and behaving within the social norms.

Teaching based on the constructivist conception of learning emphasizes flexibility and learner readiness. Only the general educational goals and frameworks of

teaching can be uniform in meaningful instruction. The aim is to create a learning environment that presents the learner with problems, tools, guidance and support. There is the assumption that a human being seeks to understand the world by looking for causes and explanations. (von Wright 1993, 19, 30.) The following Table presents some of the instructional implications of constructivism that are related to the concepts of knowledge, teaching and curriculum (cf. Driver 1988, 138; Leino 1993, 4-5; Magoon 1977, 667-686; von Wright 1993, 19-30) (TABLE 3).

TABLE 3. Instructional implications of the constructivist conception of learning on knowledge, teaching and the curriculum

Concept	Instructional implication
Knowledge	1. Knowledge is personally and socially constructed. It may be evaluated by the individual in terms of the extent to which it fits with their experience and is coherent with other aspects of their knowledge. 2. Knowledge has a complex set of referents and meanings.
Teaching	1. Teachers also bring their prior conceptions to learning situations not only in terms of their subject knowledge but also in their views of teaching and learning. These can influence their way of interacting in classroom. 2. Teaching is not the transmission of knowledge but involves the organization of situations and the design of tasks in a way which promotes scientific learning. 3. Evaluation of learning should make use of multiple criteria.
Curriculum	1. The curriculum is a programme of learning tasks, materials and resources from which students construct their knowledge. 2. The curriculum should be flexible and take into account the learners' readiness and the fact that knowledge is perennially changing.

2.2.3 Teacher and student roles in active learning

According to Keiny (1994, 158-159), the contribution of constructivist approach to the field of teacher education is to be found on the level of knowledge and communication. Once knowledge is conceived as something that is actively constructed by the learner, in a process that involves him or her subjectively, it becomes clear that knowledge cannot be simply transferred from teacher to learner. The instrumental model of the teacher as a transferrer of knowledge is misguided. An alternative model is the developmental teacher, whose role is to develop his or her students as learners, learners who are able to construct their own conceptual structures. (Cf. TABLE 4.)

TABLE 4. Instrumental and developmental conceptions of the teacher's role (Keiny 1994, 159)

Aspect of learning	Instrumental role	Developmental role
General orientation	- Technical rationality	- Reflection in action
Epistemological aspect	- Objectivism - knowledge is an external entity	- Constructivism - knowledge is a subjective construction
Task ownership	- Teacher	- Student
Assumptions about the learner	- Passive, has to be controlled: i.e. external motivation	- Active, initiative: i.e. internal motivation
Teacher's responsibility	- To instruct, transfer knowledge	- To promote student's learning processes by providing opportunities for direct interaction with knowledge
Learning goals	- Achievements as products of learning	- Learning as a process
Education of teachers	- Training or modelling their acquisition of skills and techniques	- Integration of theory and action; developing reflective and diagnostic capacities

In active learning the teacher is primarily an organizer of activating situations, an advisor and evaluator of the student's learning process. The teacher can guide students in their search and processing of knowledge, but he/she should direct them to adopt initiative, self-dependence and thus self-regulation. It is the teacher's task to create secure learning environments and he/she should also be capable of utilizing modern technology, especially computers. (Olkinuora 1994, 68; cf. Page 1990, 78-79.) Watts (1991, 93) has identified some of the ingredients necessary for active learning. Among them are:

- a non-threatening learning environment
- student involvement in the organization of the learning process
- opportunities for learners to take decisions about the content of their own learning
- direct skill teaching
- continuous assessment and evaluation
- relevance and vocationalism.

There are several characteristics of learners who had constructed their own learning. In active learning the learner wants to shape the task in hand or the scheme of work so that it becomes his or her task, and consequently the learner becomes accountable for its outcomes. As a result, the learner feels in control and fully involved in his/her own learning. (Watts 1991, 91.) According to Watts (1991, 91), active learners

- initiate their own activities and take responsibility for their own learning
- make decisions and solve problems
- transfer skills and learning from one context to other different contexts
- organize themselves and organize others
- display their understanding and competence in a variety of ways
- engage in self- and peer evaluation
- feel positive about themselves as learners.

Active learners can recognize the demands of particular tasks, take responsible decisions and seek ways to solve problems within them. They are able to judge the task for what it is worth, and tackle it appropriately. Making decisions is important;

it is only when learners make decisions towards the solution of a problem that they begin to own the problem for themselves. Active learners develop feelings of ownership over information, data, interpretations and understandings, which means that they can begin to judge the value of facts and opinions. An important attribute of active learners is that they know when a task is one to be tackled alone or one that requires collaboration with others. Active learners are also aware of the time requirements demanded by different tasks and are capable of pacing themselves to meet deadlines. They use a range of study skills, and select appropriate resources and information and the means of gaining access to them. In discussions they are able to communicate and explain their ideas and understandings so that others can appreciate them. (Watts 1991, 91-92.)

According to Watts (1991, 92-93), active learners are effective learners. They are confident enough to develop their own criteria, evaluate their own progress regularly and recognize their own competence and weaknesses. They are prepared to assist in the evaluation of others' progress and share those evaluations with the individuals concerned in a supportive way. Active learners believe in themselves and grow in enthusiasm for what they are doing. Because they are engaged in establishing their own directions and progress, they are more likely to gain a sense of success in what they do.

2.2.4 Project work in active learning

2.2.4.1 Project work as a method of experiential learning

The various forms of experiential learning offer a variety of instructional activities and experiences and thus develop human abilities and talents in a variety of ways. According to Henry (1991, 71), experiential learning encompasses many teaching traditions and covers a wide range of learning methods. These methods include among others project work, problem solving, action learning, activity based learning and independent learning. (FIGURE 3.)

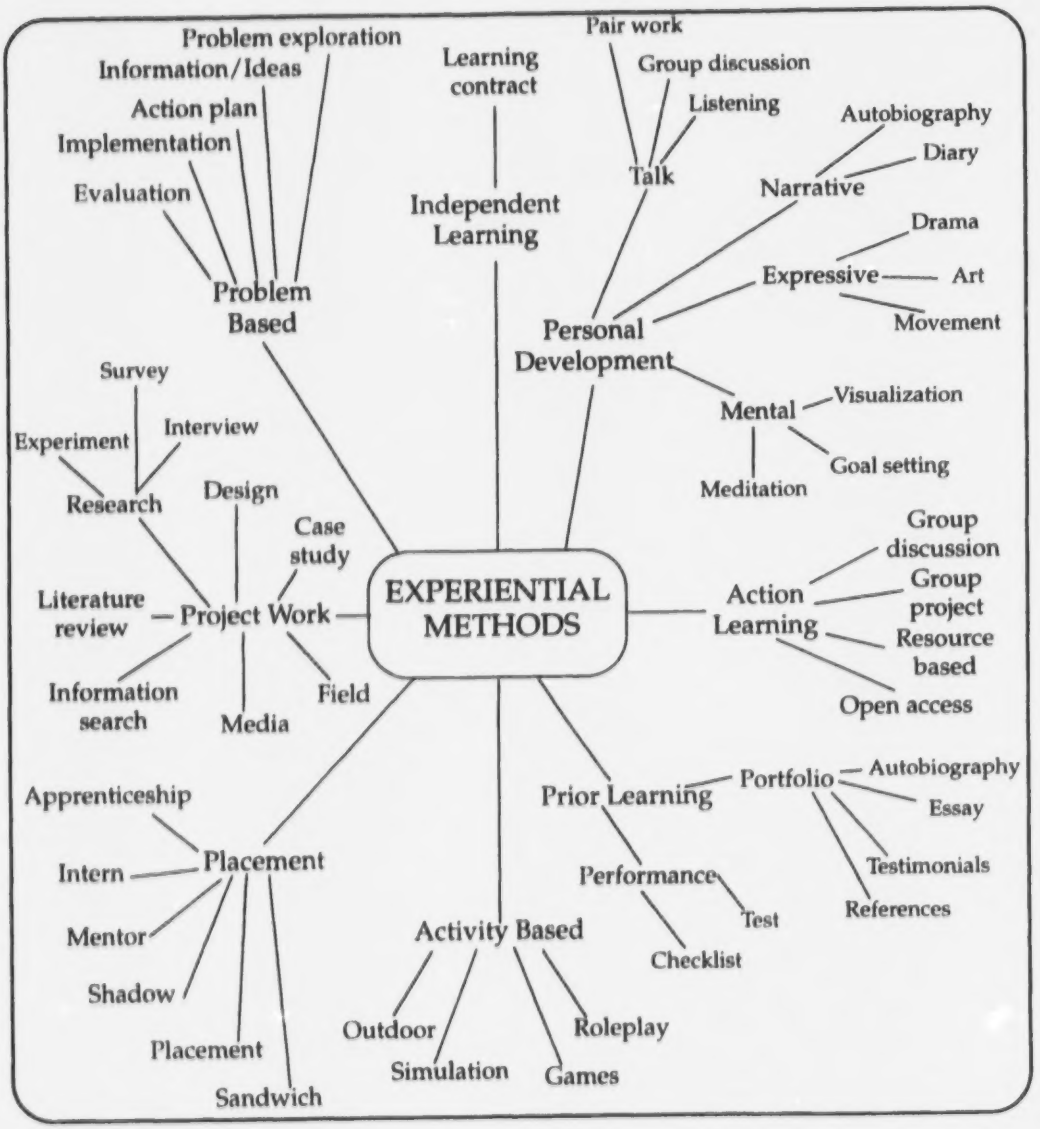

FIGURE 3. Experiential learning methods (Henry 1991, 72)

Project work refers to an extended piece of work in which the student or group of students selects a topic, collects relevant information and organizes this material into a presentation. Research projects may involve surveys, interviews or experiments. Information projects might include literature reviews, and work with primary documents and secondary sources. Design projects may involve building something tangible or just producing plans to do so. The project method focuses on developing student autonomy. It places responsibility on the student for both choosing the topic and carrying out the study. Projects are usually assessed by some form of presentation. Project-based learning proves to students that they are capable, granting the kind of self-respect that comes from the satisfaction of completing a difficult task, and partly from the knowledge that they could do it again. During large projects students can develop a belief in themselves, which allows them access to their personal power. (Henry 1991, 72-74; cf. also Kilpatrick 1922, 16-18; 1949, 14-19.)

Several characteristics of active learning are combined in project work. Project-based learning contains relatively large tasks and problem solving activities and often requires planned, persevering, explorative, and cooperative work. In other words, this learning method involves the setting of common objectives, the planning of work division, as well as cooperation and mutual assistance. (Olkinuora 1994, 68-69; cf. Leino 1992, 2-3; Pehkonen 1992, 57-65.) In the following section of this chapter we outline an ideal model of the phases of learning process in project work.

2.2.4.2 Phases of the learning process in project work

The learning process in project work proceeds in phases each requiring the complex processing of the learning topic by the teacher and students or student groups. Engeström (1987b, 45) identifies six different phases of the learning process: the phases of motivation, orientation, internalization, externalization, evaluation and control. According to Pallascio (1992, 8), the phases of the students' course during their integrative projects, however, often interact and overlap. The starting point of an ideal learning process consists, according to Engeström (1987b, 45-47, 58-61), of

a real problem and a conflict which has surfaced in the consciousness of a student or student group. The student or group then outlines a general solution model that settles the conflict. The student or group adopts an initial solution model, an orientation basis by which the entire topic under examination can be systematized and interpreted. By this orientation basis the student or group may also alter their previous conceptions, their previous knowledge structure. Table 5 outlines features of teacher and student activeness during the motivation and orientation phase of the learning process in project work (cf. Engeström 1987b, 60).

TABLE 5. Phase of motivation and orientation during the learning process in project work

Phase of process	Teacher activeness	Student activeness
I Phase of motivation and orientation	- Arousing interest by creating cognitive conflicts and presenting problems - Discussing objectives - Creating a basis for orientation - Presenting problem solving models - Utilizing advance organizers - Utilizing opportunities outside the school	- Becoming aware of a conflict or problem - Getting internally and/or externally motivated - Choosing a topic and discussing objectives - Planning of work - Constructing concept maps - Utilizing previous knowledge and experiences

The new material acquires its final meaningfulness in the interpretation during the phase of practising. It is here that the testing of new knowledge begins, as it is used to carry out concrete tasks, to change existing reality and to create new practices. The new material is enriched and refined. It becomes alive and thus starts to direct activity. Internalization and externalization are inseparably intertwined with each other. At the same time, the student or group finds an opportunity to evaluate the

knowledge they have learned and to control their own learning effectively. (Engeström 1987b, 45-47, 58-61; 1992, 15-16.) Table 6 outlines features of teacher and student activeness during the practising and reflection phases of the learning process in project work (cf. Engeström 1987b, 60; Taba 1966, 34-36; 1967, 92, 101, 109).

TABLE 6. Phases of practising and reflection during the learning process in project work

Phase of process	Teacher activeness	Student activeness
II Phase of practising: internalization and externalization	- Arranging opportunities for acquiring experiences - Providing opportunities for direct interaction with knowledge - Guiding problem solving - Teaching principles and knowledge structures - Differentiation of teaching	- Assimilating and accommodating new knowledge: - Concept formation: grouping and classification of knowledge - Interpretation: recognition of details, explanation of knowledge and making inferences - Application: prediction and verification of knowledge - Problem solving using a model, generalization and enrichment of the model - Dealing with and changing existing reality and producing something new

TABLE 6. (Continued)

Phase of process	Teacher activeness	Student activeness
III Phase of reflection: evaluation and control	- Compilation of things learned - Assessing learning process and products - Teacher's self-evaluation	- Self-assessment and peer evaluation - Experimentation, correction and supplementing of knowledge to be learned - Critical evaluation of one's learning and its outcomes

2.2.5 Cooperative learning in active learning

Learning occurs in the social context of classrooms, which are heavily influenced by interactions among the members of this community. Through the exchange of ideas with teachers and peers, students develop shared meanings that enhance communication between group members. When students work in small groups, they are stimulated by challenges to their ideas and thus recognize the need to refine and clarify their thinking. (Wheatley 1989, 269-270.)

Slavin (1985, 6-9) describes a variety of small group methods. According to Slavin (1992, 235; 1993, 1), cooperative learning refers to instructional methods in which students from all levels of performance work together in small groups, usually toward a group goal. The many cooperative learning methods differ considerably from one another. Cooperative learning methods may be quite informal or they may be structured. Cooperative groups may work together on projects or other open-ended, creative activities, or they may work to help one another master specific academic content. They may require students to take responsibility for a designated portion of the group's task, or all students may work on the same tasks. Groups may stay together for many months or may be constantly reformed.

Activities in active learning most usually involve problem-solving and investigational work and may also involve small-group collaboration, such as small-group discussion, role-play simulation or collaborative project work (Kyriacou 1992b, 42). According to Kyriacou (1992b, 42), a number of educational benefits have been claimed for cooperative learning in active learning:

- such activities are intellectually more stimulating and thereby are more effective in eliciting and sustaining student motivation and interest in the activities
- such activities are effective in fostering a number of important learning skills involved in the process of organizing the activities, such as interaction and communication skills during cooperative activities
- such activities are likely to be enjoyed, offer opportunity for progress, are less threatening than teacher talk activities and thereby foster more positive student attitudes towards themselves as learners and more positive attitudes towards the subject
- cooperative activities in particular facilitate greater insights regarding the progress of the learning activities, through the observation of peer performance and the sharing and discussion of procedures and strategies.

3 THE CONTEXT OF A SMALL RURAL SCHOOL

3.1 The context of a small school

The case study school, the Suvila* Lower Level Comprehensive School, is located in Central Finland, in a municipality of some 5500 inhabitants. About half of the working population earn their living in trade, transport and other service sectors. About a quarter work in agriculture and forestry and a quarter in industry and in the building sector. About 20 per cent of the population in this area are under 15 years old, 64 per cent are 15-64 years old and some 16 per cent are over 65. Approximately 22 per cent of the labor force are unemployed. There are nine lower level comprehensive schools operating in the municipality. Eight of these are one-, two- or three-teacher schools. In addition, the municipality has an upper level comprehensive school and an upper secondary school.

The village community surrounding the case study school consists of 200 inhabitants, of whom some 20 per cent are under 15 years old, 70 per cent 15-64 years old and 10 per cent over 65. The majority of the local people earn their livelihood in farming, forestry and in the log house building industry.

The school is the only common meeting place in the village. Consequently the inhabitants of the village community actively use the school for their hobbies and meetings. The village no longer has a store or post-office, but the municipal mobile library comes to the village once a week.

The inhabitants of the village community have taken initiatives to improve their living conditions through local activities. Such activities involve regular social collaboration. A village committee has also been formed. Small schools like this one often enjoy support from the local community (cf. Gulliford 1991, 124-125).

* To protect their privacy, the name of the school and names of people are not given here. We would like to thank the inhabitants of the case study community for their help, especially the teachers and the families with whom we stayed.

In the case of this school such supportive measures include maintenance of outdoor sports facilities and equipment, collection of money for outings and school camps, participation in these outings, participation in events arranged in the school and visits to the school as specialists in various fields of work.

> The area out there was improved by neighborly help. This indoor renovation of the school was paid for by the municipality. That whole red building over there was finished by the villagers as voluntary work...Then we have a sort of tradition that every spring we pick up the trash littered along the roadside. (Chairperson of the school board, female.)

Other factors promoting teaching and child development in small schools are the peaceful atmosphere of the school, its closeness to nature, its safety and its leisurely pace of life (cf. Bell & Sigsworth 1987, 10; Forsythe 1983b, 20; Kalaoja 1990a, 96-97). A positive atmosphere prevails in the case study school and there is a good spirit of cooperation between the teachers.

3.2 The resources of a small school

3.2.1 Physical and material resources

The case study school is located on the shore of a small lake. The school building was constructed in 1922 and repaired in 1989. Teaching facilities, equipment and learning materials are modern and appropriate. The school has three classrooms, a kitchen, dining room, teachers' room and a number of social facilities. Since the school has no special gymnasium, indoor sports are taught in the school's largest classroom and in the sports hall at the municipal center. A small separate building in the vicinity of the school has been restored for the teaching of handicraft. The school grounds include a sports field, a store for games equipment and a covered space for playing. It is possible to teach, for example, nature study and outdoor sports in the school grounds.

3.2.2 Financial resources

The teachers in small schools are also responsible for managing the often very tight budget of the school (cf. Bell & Sigsworth 1987, 182-190; Sher 1981, 43-47). The current weak economic situation in the Finnish municipalities is reflected in school budgets. The teachers are required to manage on a budget that is continually being cut. According to the budget of the case study school (1993), the school's largest expense item consists of the wages and social security expenses of the teachers and other staff. These make up about 80 per cent of the annual expenditure. Approximately one fifth of the expenses is directed towards maintaining the premises as well as purchasing school materials and necessary services. Student transportation forms the greatest service cost, comprising about seven per cent of the school's annual expenditure.

> We are given a budget frame and the school principal is responsible for its implementation. (Teacher, male.)

3.2.3 Human resources

There are two class teachers and a peripatetic English teacher in the case study school. One class teacher is the principal of the school. The school is also visited by a peripatetic special teacher. In addition to the teachers, a teacher aide and an ancillary worker who acts as a cook, cleaner and caretaker work at the school. The school board is composed of six members, a teacher and five parents. A public health nurse visits the school once a month. The teaching staff are well qualified. The principal of the school has graduated from a 3-year teacher training course and after that he has completed his degree as Master of Education. He has worked 14 years as a teacher. The other teacher graduated six years ago from a modern 5-year teacher training programme, leading to a degree as Master of Education. After their basic training the teachers have regularly taken part in teachers' in-service training.

There are 25 students, who have been divided into two basic teaching groups (cf. Laukkanen & Muhonen 1981, 268). These combined grades, as they are known, have been formed of nine students from grades 1-2, and sixteen students from grades 3-6

(TABLE 7). Five students with difficulties in reading, speech or learning receive special needs education.

TABLE 7. Student statistics of the case study school

Grade level	Girls	Boys	Total	Teaching groups
1st grade	1	3	4	grades 1 - 2 or 1 - 6
2nd grade	4	1	5	grades 1 - 2 or 1 - 6
3rd grade	1	3	4	grades 3 - 4 or 1 - 6
4th grade	4	3	7	grades 3 - 4 or 1 - 6
5th grade	2	1	3	grades 3 - 4 or 1 - 6
6th grade	2	-	2	grades 3 - 4 or 1 - 6
Total	14	11	25	

3.3 The processes of a small school

3.3.1 The background of the school's instructional practices

The case study school was founded in 1922. Up until the late 1980s traditional educational practices were reflected in the school's policy. Progressive teaching methods which placed an emphasis on student activity increased in the school's practice after the renovation of the school building in 1989. The in-service training acquired by one teacher and the replacement of the other contributed to a change in the practices. New concepts regarding knowledge and learning in schools, which emerged in Finland about the same time, further encouraged the teachers to try out alternative pedagogical approaches in their work.

> When I came to this school, the times here were such that I didn't think I would stay here. This was a reserve place for teachers from schools which were closing down... My teacher colleague was soon going to be retired, and we didn't do anything revolutionary at the school then... The renovation of the school was the first important phase... At that point I used to ponder quite thoroughly what kind of school I wanted

> to be developing. At the same time people started to talk about integration. My wife became interested in this and got me interested too... In those days I had finished my master's thesis and noticed that the books to be read for tests in educational sciences had changed a great deal from the previous time I had been studying. The reading list for the master's degree was really interesting... Dewey's ideas came up. I had of course become acquainted with them already. It contained sizeable portion of alternative pedagogics and books on the great trends of this century. I was very pleased with it and got new ideas. With the school restoration work I also entered a new phase, and then also a new teacher came here... That's how we got started with the development work. It all started up when I made these study units, projects, for the students to carry out. (Teacher, male.)

3.3.2 The school curriculum

From 1992 the case study school has been following its own curriculum, which is based on the requirements outlined by the national curriculum document, Fundamentals of the Comprehensive School Curriculum 1985 (Peruskoulun opetussuunnitelman perusteet 1985). In spring 1994 the curriculum was revised to correspond to the new national curriculum 1994 (Peruskoulun opetussuunnitelman perusteet 1994).

In accordance with the new curriculum approach, teachers, school board members, and parents participated in the construction of the school curriculum. The main responsibility, however, rested with the teachers. The school curriculum (1994) describes

- the value basis and modus operandi of the school
- the main goals of the school
- the contents of key subjects
- the contents of English language teaching
- the contents of environment-oriented subject matter
- the contents of practical and aesthetic subjects
- topic units
- the teaching methods of the school
- the construction of an individualized curriculum
- methods of evaluation.

In the school curriculum (1994) the topic units are spread over a three-year-period, which is divided into themes derived from the learning contents of religion, environmental and nature study, and history. Such themes may include the church, the forest, the farm, or the student's own history. Every year the teachers also design an individualized curriculum for each student.

3.3.2.1 The aims and principles of teaching

According to the school curriculum (1994), the main goals of the school are to provide general education and qualifications for further studies, as well as to develop the ability to confront future challenges and to foster mental growth. The most essential goals of school activities are:

1. General education. Students become acquainted with subject matter that is connected with their own lives. The aim is to create cognitive structures that facilitate the adoption of knowledge from different areas of life.
2. Qualifications for further education. The aim is to give every student basic skills by means of which they are able to study at higher school levels and throughout their lives.
3. Confrontation of future challenges. The aim is to educate students to encounter challenges set by the society of the future and to take responsibility for their own future and that of the environment. The aim is to acquaint students with the computer as a tool and which can be used in different study tasks. Another aim is to teach the student to act as a responsible group member, to plan his/her own activity and to work independently.
4. Mental growth. The aim is, among other things, to promote students' positive self-esteem, physical fitness, and expressive skills, and to create a basis for the development of their own set of values.

The development of individualized curricula has also been initiated at the school. The teachers, together with the student and their parents, participate in the

construction of a student-based curriculum. The purpose of the individualized curriculum is to secure the full development of abilities and aptitudes of each student, and in this way to utilize personal strengths. The peripatetic special teacher also takes part in formulating the individualized curricula for exceptional students.

> I would like the school to give students a resource that includes all necessary skills and social skills. In my opinion, the most important thing is that a child stays unbroken through this whole "washing machine". (Teacher, female.)

> I hope that each student can grow from his own starting points. That we at the school do not set the standard too high, but that it would not be too low either... Another important thing is finding one's own strength. The student should find the strong points in himself, which would remain with him longer than just through the time spent at school. (Teacher, male.)

The teachers in the case study school work according to educational principles, which reflect progressive pedagogics. The principles underlying their work emphasize interaction between the school and surrounding society, and learning from the student's own environment. The acquisition, processing and application of knowledge, as well as the production of new knowledge are also underlined. Cooperative work and respect for student diversity are key elements in the school's approach.

> Practical activity is one of our leading principles. The learning process should be active all the time... Responsible work... Students are not given ready-made solutions. They are given freedom of choice and room to operate... Individuality. We start from the student... There are no age divisions, instead there is cooperation between children of different ages... Cooperative skills are important. The students should learn to cooperate with different people and to appreciate diversity. We have a very positive attitude to this integration. We see it as a rich resource. (Teacher, male.)

3.3.2.2 Basic features of instructional organization

The working plan (1993-1994) of the school follows the goals and action principles outlined in the school curriculum. The school year is divided into approximately three-week-long teaching periods, according to different themes. Key subjects, including mother tongue, mathematics, and English, are delivered according to the guidelines set out in the curriculum. The contents of modern subjects, such as biology, geography, religion and history, are studied as topic units. Part of the instruction in mother tongue, and in practical and aesthetic subjects takes place in workshops. Every month students can select a workshop, for example, a video,

modelling, music, or computer workshop. Part of the art and music lessons as well as handicraft occupy a place on the schedule. Students have physical education every day.

The school day begins with morning exercise in the school yard, followed by joint morning assembly for all students in the largest classroom. The first work period of the day lasts approximately one and a half hours. The school's lower grades (grades 1-2) work as a separate group. At the same time, students in the upper grades (grades 3-6) have an individual study period of mathematics, mother tongue, or English. After the first work period all students participate in outdoor exercise and then have lunch. After the lunch, the first two grades have a story-telling hour, during which they can also rest. At the same time, the students of the upper grades work with their projects or in different workshops. During the afternoon work period all students of the school continue with their projects or study practical and aesthetic subjects. They also have a small snack in the afternoon. (FIGURE 4.)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8.50-	Mother tongue/ Maths	Mother tongue/ Maths	Topic work	English/ Maths	English/ Maths
-10.20	Mother tongue/ Maths	Mother tongue/ Maths	Topic work	English/ Maths	English/ Maths
	Outdoor exercise	Outdoor exercise	Outdoor exercise	Outdoor exercise	Outdoor exercise
	Lunch	Lunch	Lunch	Lunch	Lunch
11.30-	Topic work	Workshop	Topic work	Mother tongue/ Maths	Topic work
	Topic work	Handicraft	Workshop	Art/ Music	Topic work
-14.30	Topic work	Handicraft	Workshop	Art/ Music	Physical education

FIGURE 4. Schedule for grades 3-6 in the case study school

3.3.3 Teaching the basic skills in a combined grade

In the teaching of combined grades the teacher has to simultaneously teach two or more different age groups of children. The teaching of combined grades presupposes that the teacher has excellent organizational skills, ingenuity, flexibility, tolerance of insecurity and the skill to attend to the individual needs of every student (cf. Kimonen & Nevalainen 1993, 96-97). The small student groups in this case study school provide a good starting point for this.

3.3.3.1 Mathematics

According to the school curriculum (1994), the learning contents of mathematics are studied in an order of progression that does not depend on the grade level. This principle allows students individual movement from one level to the next, after mastering the content of the previous level. In their mathematics study students work with weekly learning contracts. At the beginning of the week the teacher gives the students instructions concerning the contract and then students follow the work plan they have constructed for themselves for the week. The students are grouped according to grade levels in different parts of the school to work on the problems of the mathematics book or the handouts prepared by the teacher. The teacher moves from one student group to another, giving individual counselling. During our observation period, for example, third graders practised multiplication and fourth graders, decimals. Fifth graders solved problem tasks using computers and sixth graders did percentage calculation problems. The students received feedback from the teacher and from the check-up hints in mathematics books. The learning contracts were checked on Friday by students working in pairs and the number of correct solutions was accorded a percentage grade. The teacher in the case study school described his mathematics instruction in the following words:

> Each grade level follows its own plan... Everybody works on their contract jobs and I teach them individually, when necessary. When we have a new topic, I take one group aside and teach it to them. Those who study new topics are in a different room and others carry on with their computation here... We start from practical problems and try to solve them. The textbook contains the correct answers. They believe very hard in getting them right. At the end of the week we check and correct what is wrong. At that point we check with those who have missed a lot, to deal with any gaps in their knowledge. (Teacher, male.)

Many kinds of problems related to teaching arrangements, learning materials and the teacher's work have been detected in the teaching of combined grades (cf. Kalaoja 1990a, 99). According to the teacher in the case study school, the most problematic are the teaching situations where completely new topics in mathematics have to be taught simultaneously to different grade levels.

> The problem arises, when several groups have to learn a new topic at the same time. (Teacher, male.)

In the parents' opinion, the main problems of contract studying in mathematics is the inability of some students to plan their work and the lack of individual guidance during the lessons. Also insufficient control regarding what has been learned during the week has been problematic.

> On Thursday night he is in awful panic and crying. He doesn't do them regularly. (Student's mother 1.)

> After teachers have given the jobs, one child felt that the teacher should be there more. (Chairperson of the school board, female.)

> If the mathematics contract tasks continue in this way, they are totally unsuccessful... They do the week's problems wrong. If parents don't interfere during the week and correct them, misunderstandings arise and they carry on the whole week in the same way. (Student's father 1.)

3.3.3.2 Mother tongue

The other teacher is responsible for mother tongue teaching at the school. According to the school curriculum (1994), the studying of mother tongue does not follow grade division, but a student advances according to his or her own abilities. In practice, however, separate teaching groups are often formed from the lower graders (grades 1-2) and of the upper graders (grades 3-6). The other teacher in the case study school described her teaching of grammar to grades 3-6 in the following way:

> I asked the whole class to sit in a ring on the floor. We rehearsed again, by means of a game, what is meant by predicate and subject... Group A left the ring and continued writing questions. With Group B we carried on the object practice through a game... The following lessons in the week mainly consisted of individual work and then I supervised students' work and gave more advice, when necessary. On Friday the students gave in their work for checking. (Teacher, female.)

In the case study school, creative writing is often practised by means of process writing. Usually the students prepare individually a concept map on a common theme and use it for writing the first version of the text. The draft is then processed in groups, in which students continue to individually refine their stories according to feed-back from teachers and group members. Finally, the stories or plays are presented to the other students of the school.

> We use process writing continually... We have some central theme, for example, last time it was parties. Students made a list of all kinds of possible parties. Next, the students prepared concept maps and then they started to write. After the writing, discussion is carried out in groups of three. They try to find the most important concept

> and exchange opinions about each others' writings. In finding the main concept the writer can test whether he has emphasized the most important thing enough. Then they ask further questions. Then the student gives me the writing and we talk about it a little... After that the student writes his story once again and in that phase it is, of course, possible to change the story... They know that the story will be published. (Teacher, male.)

During our observation period the students wrote the play for the spring festival, working in groups and following the principles of process writing. At the beginning of the writing process the teacher gave instructions to the students and handed out the necessary materials. He presented the theme, oriented the students to write a play, and reminded them to emphasize the plot. Then the students discussed the characters of the play. Next the students wrote individually for about half an hour. Some students also constructed plans in the form of a concept map. The cooperative group work that followed the individual work phase proceeded, according to our observations, as follows:

1. Instruction. The teacher gave instructions: "Choose one text from the group or form a combined play from all the texts". He also emphasized cooperation. The students started their work in groups in different parts of the school.
2. Cooperation. Observation group A consisted of five students, of whom one was in the sixth grade (girl), two in the fourth (girl and boy), and two in the first (girl and boy). The sixth grader acted as a chairperson. The students first read aloud their own writings. They voted about the working method, discussed the number of roles, and planned the duties of group members in the play. After this the students decided to combine the texts into a joint play. From time to time, the teacher guided the group.
3. Control. When the work was finished, the chairperson of the group read aloud the plot of the play and showed it to the teacher.
4. Presentation. Finally all students came together in one classroom. The chairpersons of the groups read aloud the proposals of their groups. The teacher handed out pieces of paper which students to vote for their preferred play.

3.3.4 Project method in a combined grade

In project work, the teacher functions primarily as an instructor and work supervisor. The students' skills and knowledge are based on active work and participation in problem solving. (Cf. Gutek 1992, 118-119; Kilpatrick 1949, 14-19.) In the project work of the case study school students study using themes which change every three weeks. Usually they work in groups made up of students of different ages. Both teachers supervise them during the work. In the following pages we give a short description of the different phases of the learning process in project work undertaken at the case study school, based on teacher interview. The projects were carried out in a combined grade.

3.3.4.1 Orientation

The orientation phase of the learning process in the project work involves preliminary familiarization with the topic under study. Students describe their previous experiences related to the theme, discuss common objectives, and often construct concept maps. The purpose of the orientation phase is also to arouse internal motivation. The teacher outlines the orientation phase of project work as follows:

> First we start with orientation or previous experiences... We start by looking for common objectives for the period. We draw up a concept map: what are the main points, and then we start by following some path, as an example. The suggestion comes from a student. This is the first day. (Teacher, male.)

3.3.4.2 Working

In the working phase of the learning process students examine different sources for information about their research subject. They also design experiments and examine natural objects and phenomena. Note-taking is carried out simultaneously. Students plan and carry out their project work as independently as possible.

> On the second day we start by looking for information. Everybody starts from his own plan. The student doesn't make a separate written plan for the information search... They start by looking for information about each sub-area at a time, either from books

> or some other information source. They should try to use several sources of information, not only a textbook. At this stage, we try to set up practical experiments. For example, in the electricity project we tried out conductors. Then they learn to make notes of what has been found in these experiments. (Teacher, male.)

During project work students often work in groups of five. These cooperative groups include students from all grade levels.

> Sometimes we carry out the information seeking phase cooperatively, by using the jigsaw method. There every grade has its own topic. When we are gathered together, everybody presents his own results. This information search phase often involves study trips, or we get a visitor. (Teacher, male.)

Where projects extend beyond a single week students prepare a final product, which can be, for example, a presentation, wall paper, cartoon, exhibition, book, play, or a recording. Individually the students may also make written studies.

> After the information has been collected and organized, then they start to prepare the final product... The student should process the information and pinpoint the most essential areas... Students' working style is such that they return to the information source many times during the project... In general, attention is paid to the fact that the final products should be comprehensive, and not centered on one detail that is part of the topic. Of course, they can emphasize a certain aspect, but all notions in the concept map must be treated in the final product. (Teacher, male.)

3.3.4.3 Evaluation

At the end of the project work, teachers, students, and parents evaluate the success of the learning process and outcome. Each student has his or her own study-book, in which the evaluation of the project work is recorded. In their study-books students assess the amount of work they have put into the project at school and at home. They report from where and how they accessed information for their projects. In addition, they assess the interest and usefulness of the work and discuss where they were successful during the period and where improvements could be made. The teacher also writes a verbal evaluation of the student's work in the study-book. Finally, the students take their study-books home for parental comment.

> Last comes the evaluation. The student himself assesses what he has done. We don't use much group evaluation... After that I assess the outcomes. The student gets to take his study-book home, and folks at home can make comments. (Teacher, male.)

3.3.5 Outdoor education

Approaches to outdoor education reveal the quality of implementing the local curriculum. The small school teacher has effective opportunities for implementing the curriculum outside the school. Outdoor education presupposes many kinds of skills and knowledge on the part of the teacher. He or she has to be able to answer such questions as: why, where, what and how can we teach outside the school? The teacher should realize which natural, industrial or cultural aspects of the community he/she could exploit in his/her teaching and be familiar too with the various teaching methods of outdoor education such as study visits, study trips and school camps. (Cf. Hammerman, Hammerman & Hammerman 1985, 23, 82.)

Both teachers in the case study school are acquainted with the opportunities offered by the environment around the school. In their teaching they use different outdoor education methods and targets. The activities are also closely connected to the educational principles of the school. The teaching process in outdoor education is generally initiated by work in the classroom. When they arrive at their destination students usually write notes, interview specialists and collect samples. Presentations and assessments usually take place in the classroom. When studying outside the school, the students, however, mainly observe the environment rather than participating in the activities of the village community, for example, by helping the old or publishing a village newspaper (cf., for example, Saunders 1979, 218-224).

> They ask questions and look around. When we visited the cowshed, it was about the time they were finishing the milking and cows were feeding and being led outside...The students gave food to the cows. They had to be brave enough to walk along the feeding aisle. (Teacher, male.)

The ideal process of outdoor education proceeds according to the child's developmental level in small stages from the familiar to the unfamiliar (cf. Hammerman et al. 1985, 19-21, 82; Kimonen 1989, 250; Sharp 1947, 35; 1952, 1,3). The students in the case study school have made short trips into the school grounds, to their own village and their own municipality. Only rarely have the trips and school camps taken place outside the local province. (Cf. Kalaoja 1990a, 68-69.) The students mainly study nature, agriculture, and local production plants. In addition, they usually work in groups that have been formed from students of different ages and in this case the

responsibilities and study tasks related to study are differentiated according to the developmental level of the student.

> We go out to visit production plants and the log factory area, and a couple of small industrial halls. There is a great variety of agriculture... All kinds of ecotypes can be found here. We have a nature trail over there, behind the factory... We walk in nature rather a lot. (Teacher, male.)

3.3.6 The school as the center of the village community

A small school is often the center of the village community (cf. Gulliford 1991, 79-89; Hult, Koliseva, Paakkinen & Solala 1982, 3; Kalaoja 1988a, 116-117; Kimonen & Nevalainen 1993, 102). The case study school too is the only meeting place for the village community. The facilities of the school are always used when required in the evenings and during weekends.

> All the meetings and events that take place in the village - they usually all take place here. The village has no other common meeting place. This is the most important place... A couple of years ago we had a service day. It was meant for old people and all the villagers. The students participated. Dinner was arranged here. We had here a chiropodist, a hairdresser and a physiotherapist and also measurement of blood pressure and blood sugar. The children performed there too. (Chairperson of the school board, female.)

3.3.7 The social role of the teacher in enriching the life of the village community

The survival of a small rural school also during economically unstable times presupposes that the teacher has the ability to see a social dimension to his/her work to some extent (cf. Forsythe 1983a, 104-106; Forsythe & Carter 1983, 160-162; Kalaoja 1988b, 99-106; Kimonen & Nevalainen 1993, 103). Recently, however, teachers of small schools have mostly moved to live in residential centers and have therefore often few opportunities for participating in the activities of the village community outside school hours (Kalaoja 1988b, 60-61). The principal of the case study school lives in a neighboring village, and takes part in the cultural activities of his own village community, among other things, in the youth association and drama circle. The other teacher does not live in the village surrounding the school either and is unable to participate in its autonomous and spontanous activities.

I live in an other village, so that I don't take part in the activities of this village. In my own village I am the head of the youth association... The drama circle has been operating for several years... I have been with them the whole time. (Teacher, male.)

4 FINDINGS ON THE NATURE AND DEGREE OF ACTIVE LEARNING BY STUDENTS

4.1 Descriptions of the phases of the learning process in project work in the case study school

The students in the case study school were being oriented in the topic of communication during our observation. We observed the final week of a three-week study period, when students were completing their final product arising from the topic of communication. The purpose of the week's project was for students to cooperatively prepare a commercial and a bulletin. The teacher introduced the students to the topic on Monday, and then student groups planned and carried out their work. The outcomes of the project work were evaluated on Friday at the end of the school week. In the following pages we describe the different phases of the learning process in the project work that was in progress in the case study school during our observation period.

4.1.1 Motivation and orientation

Initially all students gathered in the largest classroom of the school. They were seated at their desks in groups of five, each group including students from different grade levels. The teacher announced to the students that the purpose of the final week of the communication topic was to plan and prepare, as a group, a video commercial for a product invented by the students themselves. Motivation for the project work took place by looking at television commercials. After the viewing, the essential features of the commercials were discussed as a class.

> This week we are going to compose the final product of the communication topic. It includes two tasks, which will be done in groups... First of all, the group creates a commercial. That commercial is recorded on video tape. The group must decide by itself, what the product is that you are going to advertise... You must invent some product and after that make an advertisement that is suitable for the product, so that you could get them sold, scads of them. To refresh your memory, let's see a few commercials. (Teacher, male.)

Next the teacher explained the aims, schedule, and organization of the work and the necessary equipment.

> Tomorrow's lesson can be used for preparing the props. Today we'll prepare the commercial to the point where later on you don't have to do anything else, except maybe bring from home some clothes you need in the performance... On Wednesday we'd start shooting right away. Now, what we'll do is this: three groups start with this video, since we only have one video camera... The two remaining groups will start with the video on Wednesday... Those who start with the video, will think it over bit by bit. You make a plan about the plot, and the product must also be seen in this plan. (Teacher, male.)

As a differentiated final product, students also had to draft a bulletin during the week, whose purpose was to inform future first graders about affairs related to the school, or to offer information about the opportunities provided by the village to new inhabitants moving into the area. The text for the bulletin was intended to be planned as a group work task and typed out on a computer. The teacher emphasized the importance of successful division of work in the working of the groups.

> The bulletin is made by the publishing program...on the computer, but empty spaces are left for the pictures, and they are drawn by pencil. When you assign duties in the group, you should decide the division of work, so that those who write the texts and those who draw the pictures are different ones... On Friday everybody's work can be pointed out, when we look at the input of each person. (Teacher, male.)

Two groups of students started to work on the commercial and three groups on the bulletin. We observed more closely the project work of two groups involved in producing a video commercial. In the following section of this chapter we examine the planning, practise, and production phases of the learning process in groups A and B, as they are labelled here.

4.1.2 Cooperation

4.1.2.1 Planning

After the orientation phase, students started the planning of the commercials in small groups. Next we examine the planning phase of the learning process in groups A and B who were involved in producing a video tape commercial.

Observation group A consisted of a student from the sixth grade (girl), two students from the fourth grade (boy and girl), and two students from the first grade (boy and girl). The sixth grader acted as chairperson and she also recorded the proposals made by group members. In addition to the chairperson, most of the ideas for the planning were presented by the fourth grade girl in the group. The youngest students mainly listened and gave only few ideas. The chairperson of the group directed the discussion of the group members and frequently went to show the outcome to the teacher. The teacher gave feedback and requested the students to continue with their work. As planning proceeded, students discussed the clothes they would wear in the commercial. The teacher also gave suggestions regarding clothing.

> Girl, 6th grade: Do you have any summery skirt with flowers, for example?
> Girl, 1st grade: I don't have that sort, but I have the flowery shorts.
> Girl, 6th grade: Well, bring the pants... Where are we going to do it? We must clear these problems, so that we can start practising. It ought to be summer-like... Let's show it to the teacher and say that...

Observation group B included a student from the sixth grade (girl), two students from the third grade (boy and girl), and a student from the first grade (boy). In this group too the sixth grader acted as leader. At first the students could not agree about the topic of the commercial. The third graders of the group suggested different alternatives, which the chairperson did not, however, accept. The youngest member of the group sat rather quietly, went along with the others, and accepted ideas from the other group members. Finally, the chairperson of the group decided the topic of the commercial independently. The students then made a concise plan of the commercial on paper and showed their plan to the teacher.

> Boy, 3rd grade: Nothing suits you, see... OK, everything suits us that you say. We must get this done somehow. You suggest now, suggest yourself, you haven't yet proposed anything.
> Girl, 6th grade: You suggest.
> Boy, 3rd grade: I have already suggested, but nothing has suited you.
> Girl, 6th grade: I can't think...Now we'll make a commercial of toothpaste. Say what you like, but we'll do it about toothpaste.

4.1.2.2 Practising and producing

After the planning phase, students began the practising and producing of commercials in their groups. Students in observation group A first practised their commercial without the video recorder. By this stage, the group members' roles had already become differentiated. On the second research day students continued the dramatization. The older girls of the group also prepared props and sets needed for the commercial. The youngest members, however, sat fairly passively. When the necessary paraphernalia and sets were ready, the group started to practise using the video recorder. During the filming process the teacher gave students instructions about the use of the recorder and ensured that the events were on the video tape. After the filming, students cleared up the space, dismantled the settings and returned their role costumes to their appropriate places.

> Girl, 6th grade: I got those sodas in the picture alright. Matti, you don't have to turn the camera. Just film the kiosk. Now the camera is at the spot where you can start filming. This red starts the recording.
> Teacher: Remember now to speak up. Leena, check the distance. Remember the breaks between the shootings.
> Boy, 4th grade: Where does it shut off?
> Girl, 6th grade: Same place as you turned it on.
> Teacher: Leena, show a sign, when the filming can start.

Students in observation group B also worked on their commercial. The group leader guided the activity of her group in a dominant manner. The youngest members participated in the rehearsal and production of the commercial by taking on roles, but did not actively solve problems that emerged. Students were also dependent on the teacher's guidance.

> Girl, 6th grade: You come a little closer at this point. You don't have to move. I can take a close-up with the camera... The first one comes as practice and we won't film until the second time. This cord is not long enough. Now this thing went off... Go and get the teacher.

We next discuss the level of cooperation in groups A and B with the differentiated final product, the bulletin.

4.1.2.3 Differentiation

The observation groups started the planning of the bulletins after the commercials were completed. Students in group A began by voting about the subject of the work. They discussed the content, illustration, and method for realizing the bulletin. In the group they also discussed the division of work tasks between the group members. The project work was carried out on the last day of the week, students drawing pictures and writing the text using the publishing program of the computer. When problems emerged, students relied on the teacher's assistance.

> Girl, 6th grade: Which one do we take? The one for the first graders or the story about the village? Who wants to do it for the first graders, put up your hand? Who want to do the village thing, put up your hands?
> Girl, 6th grade: Let's do it about the village. Majority won.
> Boy, 1st grade: I could draw some pictures. Are they drawn by the computer or by hand?
> Girl, 6th grade: They are drawn by hand... What are we going to write here? Let's go and ask the teacher how this is done. Wait a bit, I will go...

Students in group B eagerly discussed the content and illustration of the bulletin and all group members presented their opinions. The group leader still behaved in a dominant way, but the group had the clear common objective of succeeding in their task. They did not require the teacher's help this time.

> Girl, 6th grade: Hey! We must write about the school. The village has a small and fine school.
> Boy, 3rd grade: Write like this. The village has a good school and 50 different families. Your children will surely be happy in a small school!
> Girl, 6th grade: You mustn't fool about.
> Boy, 1st grade: We should get this finished, so that we can go to the computer. I thought of the idea that there are fine views in the summer and lots of other things.

4.1.3 Evaluation

On the final day of the school week students came together to evaluate the outcomes of the project work. The teacher led the discussion. First they viewed the commercials produced by the students. The students were instructed to observe how the commercials affected them.

> Here comes our self-made commercial break. Look at it with an eye to what product you would like to have, as you see the commercial. (Teacher, male.)

After the viewing of the commercials the teacher enquired from the students, which product they could especially remember. He also asked about the difficulties that had arisen in the activity and drew conclusions regarding the significance and methods used by commercials. Students reported that it had been difficult to estimate the duration of the commercial. Also acting had been troublesome. Furthermore, the special effects used in commercials and the truthfulness of commercials were shortly discussed.

The bulletins were also evaluated. They were posted on the blackboard and the problems that had emerged in their construction were recalled together. Finally, the pictures were examined, and there was a brief discussion as to what draws attention, when a person looks at such bulletins.

During the joint compilation of the project work, the teacher directed the discussion by his questions although only the oldest students of the school participated actively in the discussion. The teacher gave positive feedback to students. Later on, however, he gave a more critical evaluation of the activity and outcomes of each student in written evaluations entered into their personal study-books.

In the following sections of this chapter we examine in more detail, what is meant by active learning for students in a small rural school during cooperative project work. We will pay special attention to the setting of goals, task structure, accessing of information, processes of work and learning, the utilization of work and learning outcomes, and to assessment.

4.2 Describing the main aspects of active learning in project work

4.2.1 Goal setting

The aims and goals of the school curriculum and the topic units based on them help to structure the activities in the case study school. Topic units begin with a period of orientation to the theme and the tasks related to it. This discussion involves all

students of the school. During the orientation phase of the learning process special attention is paid to the cognitive aims of the teaching. The need for all group members to participate is also stressed. Social and affective aims are not otherwise explicitly mentioned. During the orientation phase the teacher also explains the theme to the students, from which they then usually construct a concept map, showing closely related topics. By choosing the contents of the concept map students also have an opportunity to determine the objectives of their activity.

> We talk with the students about the cognitive aims. These other ones come through the methods of work and are, in a way, in my possession. The students probably don't know that the issue is to adopt better cooperation skills... At the beginning of the project work we have a discussion, where also students may set objectives for the period... Students suggest matters that are important for this topic... We decide what the central issues are and prepare the concept map further... The students can plan their final product themselves. They must plan how they will do it and at the same time the objectives must be set, in view of the final product. (Teacher, male.)

> The teacher has asked us, if we want to do this kind of thing or that kind of thing. Sometimes they are nice, and sometimes not. (3rd grade student, boy.)

During our research period the students did not, however, have much opportunity to set the objectives for their activity in the orientation phase of the learning process in the project work. The teacher explained the aims and objectives of the communication project to the students. He wanted to make sure that the project work would be finished in a relatively short time, and therefore restricted the handling of the unusually extensive topic early on in the orientation phase. In the cooperation phase the students had, of course, an opportunity to set objectives for their activity and to observe their achievement.

> This time I had an exact plan we followed. We had three weeks and... this is a large unit for the students to approach. That is why I took out certain sub-areas from it myself. (Teacher, male.)

The working principles of the school emphasize the interaction of school and society. During our observation period the teacher also sought to link the learning objectives to life outside the school. In connection with the communication topic, for example, students compiled statistics on the TV programs they watched at home. A newspaper reporter also visited the school and described his work.

In conclusion

The action principles of the school emphasize students' freedom of choice in the learning process. Nevertheless, in the course of our research period during the orientation phase of the learning process in the project work the teacher defined the aims and objectives of the students' activity and the work method quite precisely. For the cooperation phase, however, students could also set their own objectives and then monitor their achievement. The students had an active role during the project, involving goal-oriented and self-assessing activity which was directed by metacognitions (cf., for example, Driver 1988, 138; von Wright 1993, 27-28; Watts 1991, 91-92). The teacher specified what the students had to study during the week, but the student groups had the principal responsibility for the course of action by which they achieved the defined goals (cf. e.g., Platz 1994, 420). In Table 8 we have collected observations about student participation in goal setting during our research period.

TABLE 8. Student participation in goal setting during the research period

GOAL SETTING	FINDINGS
G1 Teacher asks students what they would like to learn	- In the teacher-directed orientation discussion the teacher presented the aims and objectives of the project work to the students; in the cooperation phase small groups of students set the objectives connected with the implementation of the project work, on the basis of the aims and objectives presented by the teacher
G2 Teacher asks students what they would like to do in order to achieve a learning goal	- In small groups students selected the themes, from alternatives given by the teacher
G3 Teacher asks students what is the purpose of the activity	- The meaning of the topic unit was discussed during the orientation discussion of the project work
G4 Teacher tries to discover students' interests	- During the orientation phase students usually construct a concept map to guide their own activity, as they do in mother tongue process writing; in the project work during the observation period, the teacher discussed the choices made by the students with them
G5 Student asks teacher what is the purpose of a current or planned activity	- During the teaching period students appeared motivated; students did not ask the teacher about the purpose of the activity
G6 Student asks another student what is the purpose of a current or planned activity	- No uncertainty seemed to exist in the student groups concerning the purpose of the activity
G7 Student states the purpose of a activity on his/her own initiative	- Students did not discuss the purpose of the activity on their own initiative
G8 Teacher explains the purpose of a current or planned activity	- The teacher explained the purpose of the activity at the beginning, during and at the end of the learning process
G9 Discussion includes relevance of new knowledge to a context outside of school	- Students' homework during the project work was to observe their own watching of TV; at the end of the period a reporter also visited the school, describing his work

4.2.2 Task structure

The teaching aims set by the school curriculum document (1994) emphasize, among other things, independent planning and working, as well as responsible group membership. On the one hand, the working principles stress individuality and, on the other, cooperation between children of different ages. In practice, the teaching process is realized by alternating individual, pair, and group work. Usually the teacher decides on the method of work to be used. During group work, however, students often have an opportunity to choose independently, how they carry out the project work, for example, by producing a wall poster, book, or exhibition. The topics are determined on the basis of teacher's presentations, the group's own choice, or by the drawing of lots. At the beginning of the teaching and learning process the class often construct concept maps together, to direct independent accessing of information. The concept map offers students alternative ways of proceeding, which start from their own interests. By means of the concept map the teacher can also define the most important areas a student should study. During our observation period the teacher gave students fairly precise directions for the project work, explaining the objectives, topics, and methods of work. The students then independently planned and produced a commercial and a bulletin in small groups.

> The first part even includes very individual phases, when information is collected and accessed. It is mostly pair work. The whole final part of the project, the product, is often group work. (Teacher, female.)

> In the data collection phase students go through every sub-area of the concept map and compile notes on them. After that they can proceed along their own interest area... To some extent, I guide the groups into the tasks with different degrees of difficulty... Sometimes I command, and sometimes they may choose by themselves, and sometimes we cast lots. (Teacher, male.)

At the beginning of the school year the students of the school (25 in all) are divided into five permanent small groups, with five students in each. The groups include boys and girls from different grade levels. In forming the groups efforts are made to take social skills into consideration. The students work in the same basic groups also during study visits and field trips connected with projects. During field trips and school camps further away from the school students may, however, often form groups freely. Outside school time students do not function in these groups.

> A group must include girls and boys, older and younger. We don't put those who don't get along with each other in the same group... A student who bears responsibility is appointed for every group. He is not necessarily the chairperson. In general, the chairperson is the oldest in the group. (Teacher, male.)

In a small rural school the small number of students often causes problems in the formation of smoothly functioning groups (cf. Kalaoja 1990a, 56). According to the teacher of the case study school, however, small groups formed by students from different grade levels have the benefit of being natural: in project work students of different ages have the opportunity to learn from each other. The upper graders, in particular, have learned to work together, but students from the lower grades nonetheless prefer individual work methods to group work. They are also fairly reticent in expressing their opinions in groups. During our observation period, the upper grade students directed the project work, while the students from the lower grades tended mainly to remain as passive on-lookers. During the cooperation phase, the teacher tried to offer guidance to all small groups, but he nevertheless had to concentrate on groups with special needs students. In the communication project two groups demanded significantly more support from the teacher in producing the commercial and the bulletin than the other groups.

> Small children learn many things from the bigger ones. It is useful for the bigger to explain things to the smaller ones. That way they learn, and things become organized in their minds... That is children's natural way of acting... The small ones have to still grow into that. They may be so shy that they dare not give their opinion... I try to support those groups who don't seem to be able to advance. (Teacher, male.)

> I haven't talked much in that group with Liisa... Liisa is in the second grade. (1st grade student, boy.)

> Usually the group leader says what we'll do. She doesn't always go along with what others propose. She may refuse... Generally it's OK with me what they do. As long as it's good. (3rd grade student, boy.)

Frequent interaction between teacher and student has been regarded as a key advantage of a small school, enabling the teacher to provide individual and immediate feedback on student activity (cf. Bell & Sigsworth 1987, 10; Kalaoja 1990a, 61-62). In the case study school the teacher gave positive feedback to students in the joint compilation of project work. Later on, he also wrote an evaluation of the activity and outcomes of each group member in the students' study-books. The teacher assessed, among other things, initiative and responsibility in group work. If a student had succeeded exceptionally well in his or her project work, or had

expressed constructive ideas during the learning process, the teacher also attached a sticker to the study-books, as an incentive. In addition, he gave students feedback on their success by using different color circles.

> I put feedback in the study-books. If one has taken initiative in the group or taken responsibility for it, then I give feedback... The one who has most exceeded himself, gets a sticker. (Teacher, male.)

> The teacher writes in everyone's study-books how they have done that period... A yellow circle means that the task is finished. Red one that it's been done well. Blue means that work has been done excellently. Blue plus sticker means that it's the best work in the class. White means that the task is unfinished. That's the worst circle. (4th grade student, girl.)

In conclusion

Table 9 displays our observations concerning task structure during our research period. The teacher's level of activity increased predominantly during the orientation and evaluation phases of the learning process in the project work. At the beginning of the teaching unit, the teacher introduced the students to the goals and the topics, as well as the work method. During the activity he guided and encouraged students. At the end of the project work he also gave students feedback on their activity and outcomes. Teacher guidance, however, was focused mainly on the small groups that included special needs students. (Cf., for example, Keiny 1994, 159; Olkinuora 1994, 68; Page 1990, 78-79.) The strength of groups formed from students of different ages was their naturalness. During the cooperation phase, special emphasis was placed on students' initiative, independence, responsibility, and cooperativeness. (Cf. Jaques 1991, 98-99; Kyriacou et al. 1990, 1-2; Slavin 1991, 80-81; 1992, 333.) The most problematic aspect in the group activity was the timidity of the youngest group members in expressing their own opinions.

TABLE 9. Task structure during the research period

TASK STRUCTURE	FINDINGS
T1 Choice of task activity	- The teacher decided the topic of the project, then students planned their own activity in small groups, on the basis of alternatives given by the teacher
T2 Choice of task format	- The teacher decided that students worked in small groups
T3 Task differentiation	- Every group was to finish two project tasks during the school week; task differentiation within groups was based on student discussion; the oldest student always acted as chairperson of the group
T4 Task activity requires co-operative effort	- Both project tasks required a great deal of cooperation inside groups, but not between groups
T5 Students are given incentives other than grades or marks	- During the project work the teacher gave oral incentives to students in many ways; after the project work the teacher wrote feedback on each student's activity and outcomes in study-books and attached a sticker for good performance
T6 Individual students' grades or other rewards depend on performance of other students	- Students were to point out clearly the contribution made by each member of the small group, which was individually assessed later on
T7 Number of students in whole class	- All students in the school participated in the project work (22 students)
T8 Number of students in each small group	- Each small group had from four to five students; a group included girls and boys from different grade levels

TABLE 9. (Continued)

TASK STRUCTURE	FINDINGS
T9 Duration of small group membership	- Students belong to the same small group throughout school year; the project work was carried out in small groups during the topic work and workshop periods of the schedule in the course of the five day school week
T10 How members are assigned to small groups	- The teacher had chosen the members of permanent small groups
T11 How tasks are assigned to students	- Students decided independently on tasks in the small groups; the teacher, however, guided and gave advice, if the group had problems
T12 Students are expected to work together outside class time	- Project tasks usually require group work also outdoors, but this was not the case during this project work; students do not continue to function in small groups outside class time

4.2.3 Accessing information

Active learners in project work are involved in selecting the most appropriate resources and information and the means for gaining access to them (Watts 1991, 92). Students in the case study school have access to many encyclopedias and reference books from a variety fields. A mobile library also visits the school once a week, offering its services to students in search of information. Furthermore, students access information by observing and studying their environment and by interviewing specialists during field trips and school camps. In addition to this parents, representatives of various occupational groups, and other inhabitants of the village and municipality sometimes visit the school as specialists.

> When we have topics outside the school, then students interview people there. When we go somewhere, they prepare the issue and think what it is that they should find out. Those things are then asked, observed, and investigated. They often ask for brochures. (Teacher, male.)

> Parents provide information. In the electricity topic I poured out information to the whole school. Also other students borrowed literature about the field from us. (Student's father 1.)

Problems formulated by students themselves direct them in the search for new information and in the selection of methods for obtaining it. At the beginning of a topic unit students usually access information individually. Then they continue the handling of the same topic by preparing a piece of project work in small groups, which involves them in a collective search for information. In this connection, it is not uncommon that authentic learning situations outside the school help to expand the resources available for accessing information. In the self-assessment part of the project work students explicitly describe in their study-books, where and how they have been accessing information for their work. During our research period student groups were expected to plan and produce cooperatively a commercial and a bulletin. The project offered students many problem-based information accessing situations. According to the teachers, students usually acquire the necessary information for their project work autonomously from the available information sources, as had been the case previously in the agriculture and space projects.

> In the project connected with agricultural issues the fifth and sixth graders reflected on what they don't yet know about agriculture and what they should find out. We started from these problems. They visited farms, interviewing and asking questions... They made a report about it which showed the problems they had started from and how they had found a solution to them. (Teacher, male.)

> We must write in the study-books, where we have collected information from during that period. It has things from newspapers, videos, books, and all sorts of these... I myself ask my parents, others, and mostly the teacher... We have visited a farm, a pig house, and our home, because we have bulls. We went around all these places during the farm project. One group always visited one farm... When we came back to the school, we put together the questions and things and made a presentation about them. (4th grade student, girl.)

In conclusion

One of the main purposes of projects is to practise and develop skills in finding and using relevant information to create a meaningful product (Beswick 1987, 56). Small rural schools, however, do not usually have a wide variety of teaching equipment and materials needed for project work. For example, a separate library room can scarcely be found in any small school. On the other hand, teachers in small schools usually actively utilize the opportunities provided by the immediate surroundings

of the school in their teaching. (Cf. Kalaoja 1990a, 48, 68-69, 90.) The students of the case study school are used to accessing information from many different sources both at the school and outside the school. In Table 10 we have collected our observations about the accessing of information by students.

TABLE 10. Accessing information during the research period

ACCESSING INFORMATION	FINDINGS
I1 Sources of information	- Students received information from teachers, teacher aide, fellow students, computer programs, television commercials, parents, and from the reporter who visited the school as a specialist
I2 Exposure of students to new information	- In the orientation and evaluation phases of the learning process in the project work the teacher taught all the students of the school together in the same classroom; in the cooperation phase the teacher went around guiding students in small groups
I3 Outdoor experiences during school day	- Projects usually involve field trips outside the school; during the observation period students also borrowed books from the mobile library

4.2.4 The process of work and learning

The working principles of the school emphasize active learning processes. Students are expected not only to adopt, process, and apply information, but also to produce new information. The implementation of these principles is the specific aim of the school's cooperative project works, where students of different ages work together. The learning process arising from the communication topic included three phases:

1. Motivation and orientation
2. Cooperation: planning, practising, producing, and differentiation
3. Evaluation.

The processes of work and learning in the case study school have already been described in detail previously (cf. chapters 3.3 and 4.1). We will next examine the work and learning processes connected with the project work, mainly from the point of view of teacher and student roles. We will also discuss the problematic aspects of cooperative learning in the school.

During the orientation phase of the learning process in the project work the teacher sought to motivate the students and gave them clear instructions for the work. During the cooperation phase he gave advice and guided the small groups, whenever they needed help. During the evaluation phase the teacher then examined the products of the students' project work with them. Finally, he wrote an evaluation in the study-books. During the orientation phase the teacher emphasized the importance of participation by each group member in the group work. He did not, however, give other directions related to social behavior, such as advice on leadership, decision-making, confidence-building, or conflict solving (cf. Johnson & Johnson 1992, 68; Watts 1991, 41-42). Social goals were not brought up in the joint evaluation discussion either. Instead, the students received individual feedback on their activity as group member in their study-books. Less time could be used for the joint evaluation discussion than had been planned. Students' work on the commercials and bulletins took more time than had been expected, because only one videotape recorder was available.

> I am not the center of attention for long... I think the responsibility is a good thing for getting the work done. Then they have personal motivation for doing the work, and no external authority is needed...The chairperson's responsibility is to see that all group members participate in doing the task. I sometimes ask about each student's share in the task, and we discuss the need for everybody to take part in the work. (Teacher, male.)

According to the teachers, the learning process of the project work we observed proceeded virtually as planned. All small groups finished the commercial and the bulletin. In the cooperation phase students exchanged information in small groups, enlarged presented ideas, and encouraged one another. They solved problems that

emerged by discussing, voting, observing other groups, and by asking the teacher's advice. The chairmen of the groups had a high degree of responsibility. Problems also appeared in the cooperation of the groups during our observation period. Cooperative problem solving by negotiation and conciliation was difficult for many students. Groups in which the group leader was dominant or which included special needs students, often drifted into arguments about the realization of the project work. For example, as students were writing a play, considerable differences appeared between the groups in the cooperative problem-solving process. Decision making in group A seemed to be easy. Students first decided to vote, whether they would take the manuscript for the play written by a group member to be worked on further, or whether they should construct a common piece of writing. On the basis of voting students decided on a joint story, for which they took some ideas from the writing of each student. The chairperson of group B acted in a more dominant way than the leader of group A. All members of group B had first written their own stories, as the teacher had instructed. In the group students wanted to decide by voting, which story was to be developed together. At the chairperson's request students, however, took one vote after another, until the final result very closely resembled the chairperson's proposal.

> They have some really strong disputes. One thinks of an idea and doesn't let go of it, and the others don't approve this idea... It is a typical problematic situation... And then I also have to solve these with them. This week the group work of those students has advanced exceptionally well, in comparison to the problems they usually have. (Teacher, male.)

> First there is a terrible argument. Then they always say that we can't take such an idea. Sometimes we think of a totally new topic, and don't take either one... It is difficult to work in the group in that sense, because everybody always disagrees. Sometimes it seems that nothing will come out of it. (4th grade student, girl.)

Holistic, cooperative project work requires many skills and potentials from students. It is natural that the members of the fairly heterogeneous small groups of the case study school participated at different levels in the achievement of the project work. Students from the lower grades became tired sooner than those from the upper grades. They had less initiative and they often passively waited for advice and instructions from the older group members. Student activity was nevertheless not dependent on the teacher's presence which, according to him, had been a problem earlier. Accessing information needed for the project work from

source books, and the subsequent processing of the information for the purposes of individual reports, was also problematic for some students of the school. Information processing was restricted, among other things, by a student's inability to understand what he or she has read, in which case the student easily contents him or herself with copying the text directly from the book. According to the teacher, students do not take a critical stand regarding information either. They are still often incapable of drawing hypotheses from the final result. Instead, they accept the first solution to their problem that occurs to them. During the cooperation phase some small groups also utilize survival strategies, and therefore the production of work can be done as a matter of routine by following, for example, the preferences and ideas of one group member.

> Some students have no interest in participating in the work. They do, of course, very nicely what another group member orders, but they take no initiative... Information accessing is troublesome for some students. It is a problem for them to find the sources. Some have a problem with reading speed and such students tend to copy from one book only... They will accept any answer. They haven't by any means learned to doubt their own result... Students are in danger of adopting a certain format for the final product, if we didn't change the methods of work from time to time... In the writing task on Wednesday one group used a survival strategy. It was a story made up by one student, and the others accepted it without complaint. (Teacher, male.)

In conclusion

We have examined above teacher and student roles in the orientation, cooperation and evaluation phases of the learning process arising from the project work in the case study school. Furthermore, we have discussed problems that emerged in the activity. The essential tasks of the teacher in the orientation phase were student motivation and instruction giving. During the cooperation phase he actively gave advice and patiently guided the activity of the small groups. During the evaluation phase the teacher examined the products with students. Later on he also wrote feedback notes on student outcomes and their work. (Cf., for example, Johnson et al. 1990, 43; Olkinuora 1994, 68; Page 1990, 78-79.) The project work which was carried out in small groups gave students the opportunity for active interaction with one another and for jointly solving problems that arose from the tasks (cf., for example, Kyriacou 1992b, 42). The most problematic element in the cooperation of the groups was the scarcity of negotiation and conciliation skills in conflict

situations and the passivity of the youngest group members, especially in the planning of the work. Problems also emerged with information processing, students selecting, grouping, classifying, and interpreting information at a basic level only (cf. Watts 1991, 41-42). They were often satisfied with fairly routine solutions. Simultaneous mastery of the social and cognitive goals set for small group work is certainly a difficult challenge for students in the active learning process of project work. However, projects offer students a unique opportunity to develop skills and abilities, such as problem-solving, social and communication skills, and therefore the learning potential of projects is significant (cf. Jaques 1991, 98). Our observations regarding the work and the learning processes in the school during our research period have been summarized in Table 11.

TABLE 11. Work and learning process during the research period

PROCESS OF WORK AND LEARNING	FINDINGS
P1 Students interact with teacher	- During the cooperation phase of the learning process in the project work the teacher circulated and gave advice to small groups, allowing students to ask for his advice continually; during small group work students suggested to the teacher many different ways of realizing the commercials and bulletins; in the evaluation phase students described to the teacher the connection of current material in the project work to previously learned material
P2 Small-group interaction among students	- In small groups which were composed of students of different ages students exchanged information, elaborated ideas, and encouraged other group members; the youngest students however expressed reticence and frustration; some students also expressed their frustration with regard to the younger, more passive, or more dominant members
P3 Individual work	- During the observation period students worked individually in mathematics and mother tongue, when they completed tasks in textbooks or teacher's handouts; student pairs checked each other's tasks and the teacher attended to remedial instruction
P4 Degree of engagement of students	- During the different phases of the learning process the oldest students usually participated actively; the youngest students were often passive, especially in the planning
P5 Teacher's role	- During the orientation and evaluation phases of the learning process the teacher's role was essential; during the cooperation phase the teacher mainly guided and advised student groups
P6 Hypothesis formulation and testing	- Students did not formulate or test hypotheses during the observation period; students easily accepted the first solution that emerged to their problem
P7 Other aspects	- Other problems also occurred in the cooperation phase, including the tendency to follow routines for accessing and reporting information

4.2.5 Utilizing the outcomes of work and learning

The products of the students' project work are utilized to some extent in the activities of the school and its surrounding village community. Students' essays have been published in the local papers and they have been performed in parties for the village community. Students can also exploit in their projects the products that other students have generated earlier and which are kept at the school. During our research period the school bulletin compiled by the students in the communication project was sent to future first graders.

> Sometimes we have prepared a page for the local newspaper, about school camp, for example. This final product is the kind that will be sent to new first-graders... Previous final products are used as information resources... They hang on the walls and are kept on the shelves for reading. (Teacher, male.)

> Music is used in village parties. Sometimes we are performing and sometimes accompanying. (Teacher, female.)

Because the school is the only common meeting place in the village community, the meetings and parties of the community are held at the school. To some extent, students also participate in the activities arranged by the village committee, such as the service day for the old. They have also organized bazaars at the school and cleaned up surrounding roadsides.

> We always organize a Christmas bazaar. Parents and villagers came shopping there... It's our job every year to clean up those roadsides. The village committee organizes it. Most students are there cleaning up. (4th grade student, girl.)

In conclusion

The Finnish school, which conventionally has relied on traditional pedagogics, evolves into an institution that is isolated from the rest of the world, and thus also the utilization of the outcomes of schools for purposes other than learning is fairly infrequent. It has been the general feeling that the development of schools is their internal affair. However, in comparison to urban schools, the small rural school has oriented its activities more comprehensively towards the surrounding community (Bell & Sigsworth 1987, 207-214; Forsythe & Carter 1983, 165-167; Gulliford 1991, 79-89, 124-125; Pirhonen 1993, 51-61). Table 12 summarizes our observations

regarding the utilization of the results of work and learning in the case study school.

TABLE 12. Utilizing the outcomes of students' work and learning during the research period

UTILIZING THE OUTCOMES OF WORK AND LEARNING	FINDINGS
O1 Using the products of students' work	- Products of students' project works are often published in the local paper; students usually perform at the parties of the village community; during the observation period the school bulletin made by students was sent to the future first-graders; students' completed project outcomes are available for other students' use
O2 Other aspects of work outcomes	- The meetings and parties of the village community are held at the school; students have sometimes participated in the events arranged at the school, such as the service day for the old; students organize bazaars at the school, when necessary, and annually take part in the voluntary work of the village community, such as cleaning up roadsides

4.2.6 Assessment

According to the Fundamentals of the Comprehensive School Curriculum (1994, 24-25), the purpose of evaluation in schools is to promote students' growth in the direction defined by the goals of the curriculum. Evaluation should also contribute to the continuing renewal of teaching. Feedback informs students as to their individual progress, social growth, study skills, and learning results. Increasing attention is, however, attached to the learning process, because evaluation should encourage students to set their own goals, plan their work, and make independent choices. We will next examine the evaluation practices in the case study school.

4.2.6.1 Students' study-books

In the case study school the teacher, students and parents participate in the assessment of the learning process and its outcomes. The student's personal study-book shows the assessments of his or her progress regarding application, or subject performance, such as behavior, diligence, mathematics, mother tongue, English, art, handicraft, music and physical education, and in all project works and workshops carried out by the student. Assessment is based on the aims and objectives set by the teaching, and it also takes into consideration the student's developmental level. In addition to the study-book evaluations, students receive a written report at the end of grades 1-4, and a report card with grades at the end of grades 5-6.

> Assessment is always tied to aims and objectives and students' developmental level... The student's own objectives are written in the study-book. It traces the achievement of the student's central objectives during the whole year. (Teacher, male.)

> These individual report cards are really lovely, although they don't have grades... Parents are invited to hear the teacher's verbal evaluation around Christmas and in spring. Then the student, teacher, and the parents are present. This teaching style has encouraged my daughter a lot. She was very timid at first, but she has now gained more confidence. (Chairperson of the school board, female.)

During the evaluation phase of the learning process stimulated by the project work the outcomes are first examined under the teacher's direction, by means of the concept map which was usually constructed earlier during the orientation phase. Later the student, teacher, and parents assess the study period in the study-book, each according to their own perspective. During our observation period the discussion of the evaluation phase emphasized mainly the achievement of cognitive objectives. In the individual feedback reports in the study-books the teacher further assessed the outcomes of the project work and the contribution of each student as a group member. The following example is from the teacher's written assessment of a student's outcome and work in group A during the communication project.

> Your movie analysis was carefully done. The summary of TV-monitoring is clear. Your commercial (Chap-soda) is varied and effective (although perhaps too long). It seems that there wasn't enough time for preparing the bulletin. On the whole, your group was successful in its work. You acted as a responsible group leader. (Teacher assessment in the study-book of a 6th grade student, girl.)

4.2.6.2 Students' self-assessment

According to the Fundamentals of the Comprehensive School Curriculum (1994, 25), a student should adopt the routine of constantly analyzing his or her own study habits, as well as those of others, by using a variety of forms of self-assessment and group assessment. In the case study school students evaluated their own project work by means of the self-assessment form in the study-book. They reviewed the amount of work covered during the period spent at school and at home, information accessing methods, their interest in the issues studied, the usefulness of the topic, and the success as well as the problematic areas of their project work. Nonetheless, students' self-assessments mainly dealt with the product and the working process leading to it, focusing primarily on the cognitive and psycho-motor objectives. Students do not consciously evaluate social or affective objectives. Neither do they assess each others' outcomes or working processes.

> They do, of course, always declare these opinions: "What a fine work you have!" I don't consciously direct them to express opinions. They could do it more often. Children of this age should be instructed rather carefully in the assessment of others. They do assess relatively all the time, and don't take the other students' level into consideration. (Teacher, male.)

During the later phase the teacher read over students' self-assessments in the study-books and also wrote up his feedback in the books. He was primarily interested in comparing students' conceptions regarding the success of the learning process with his own conceptions and with the objectives that were set for the project work earlier, during the orientation phase. According to the teacher, most students' self-assessments are usually realistic; only a few students over- or underestimate their work.

> I compare my opinion with the student's opinion... With certain students they always differ... There is unfortunately not very much time for discussion with these students... The majority of the group evaluate themselves in a surprisingly realistic way. (Teacher, male.)

> The study-book has, of course, the child's own assessment... I think that they've assessed themselves too severely, when compared with what the teacher has written. (Student's mother 2.)

In conclusion

The continuous monitoring, observation, and evaluation of the activity of individuals and groups is essential in the learning process generated by cooperative project work (cf., for example, Hunter & Scheirer 1992, 139-145). Besides assessing students on how well they learn the assigned concepts and information, group members should also receive feedback on how effectively they collaborated (cf. Johnson et al. 1990, 61). The evaluation practices of the case study school mainly follow the evaluation principles set out in the new Finnish curriculum guidelines. The monitoring of the learning process and outcomes is a continuous process at the school. In the course of our observation period during the evaluation phase of the learning process arising from the project work, special attention was given to the areas in which a student succeeded. The achievement of social objectives was not explicitly reflected on as a group, instead, the teacher offered a written assessment of each student's cooperation skills in the personal study-books. The student and his or her parents also evaluated the student's learning process and its results in the study-books. Students were not instructed to assess the work of their groups. Neither did they consciously evaluate each others' outcomes or working process. Nevertheless, according to Johnson and Johnson (1992, 69), in cooperative learning time should be devoted to group self-assessment meaning, among other things, that the members of the groups need to reflect how well they maintained effective and functional relationships between the members. Such reflection helps to develop learning and cooperation skills and ensures that members receive feedback on their participation. In addition, it helps group members to take responsibility for one another and reminds students of the fact that they should be consistent in practising cooperation skills. Table 13 summarizes our observations with regard to the assessment of learning and the learning process in the case study school.

TABLE 13. Assessment of students' learning and learning process during the research period

ASSESSMENT OF LEARNING AND LEARNING PROCESS	FINDINGS
A1 Teachers asks students to write or state what they have learned	- In the evaluation phase of the learning process arising from the project work all students of the school discussed the outcomes of work under teacher direction, and attention was mainly directed towards the achievement of the study task, as opposed to the cooperation skills of the groups
A2 Student writes or states, without immediate prompting by the teacher, what has been learned	- During the cooperation phase students did not assess intentionally the activity of their own or the group members; during the evaluation phase students assessed their own activity in their personal study-books
A3 Teacher asks students to write or state how material just learned relates to previous learning	- Student outcomes are usually examined in the joint feedback discussion of the evaluation phase by means of the concept map constructed earlier in the orientation phase; the commercials and bulletins produced during the observation period were examined from the standpoint of findings previously made about communication
A4 Student writes or states, without immediate prompting by the teacher, how material just learned relates to previous learning	- Students did not, on their own initiative, relate the things they learned in the project work to previously learned material, instead, the reflection on what had been learned took place under the teacher's guidance
A5 Range of learning outcomes discussed by students	- In the evaluation phase of the learning process students focused, under the teacher's direction, predominantly on the cognitive and psycho-motor learning outcomes in the project work, but did not pay attention to affective or social outcomes
A6 Discussion about learning outcomes that were unpredicted	- No attention was directed towards unpredicted learning outcomes

TABLE 13. (Continued)

ASSESSMENT OF LEARNING AND LEARNING PROCESS	FINDINGS
A7 Range of learning outcomes on which teacher gives feedback to students	- During the joint discussion in the evaluation phase of the learning process the teacher gave students feedback on the achievement of cognitive and psychomotor objectives; later he also wrote an assessment regarding the achievement of social objectives in the students' personal study-books
A8 Range of learning outcomes on which students give feedback to one another	- During the cooperation phase of the learning process students occasionally gave feedback to the other members of their group
A9 Identification of each student's contribution to the group outcome	- The teacher gave a written assessment of the contribution made by each member of a small group in the students' personal study-books
A10 Performance standards	- The outcomes of the project work were evaluated on the basis of the teacher's questions during the joint discussion session and also in students' study-books
A11 Students reflect on causes of success or failure to achieve learning goals	- During the evaluation phase difficulties that had emerged in the project work were discussed, under the teacher's direction, and conclusions were drawn about successful special effects of commercials and bulletins
A12 Students write or talk about how to improve their performance	- Students did not explicitly discuss how they could improve their performance
A13 Students discuss effectiveness of task structure or learning process for achieving goals	- Students did not discuss means of improving the effectiveness of the task structure or learning process in order to achieve learning goals more successfully
A14 Assessment of effective group functioning	- Effective group functioning was not assessed; feedback was given only with regard to the individual contributions made by the group members in the students' personal study-books

5 FINDINGS ON THE NATURE AND EXTENT OF ACTIVE LEARNING BY TEACHERS

5.1 The learning process of the teacher in a changing school culture

The implementation of changes in the school system involves the teacher in an active learning process. According to Fullan (1992, 87-92, 98-113), there are close links between a teacher's life-long learning, the implementation of school reforms, and students' progress. If a teacher's work practices are to change, then the teacher's learning process will involve changes in his beliefs and conceptions. A teacher's readiness for cooperation and experimentation also helps to promote development. Often, a change in the school system presupposes external pressure, assistance and support.

Schools, in common with other organizations, have their own culture and traditions, which often unconsciously direct and control the school's activity. A conscious endeavor to change the culture of a school opens up new possibilities for the renewal of the school. The development of a school is a comprehensive process, involving not only the reform of curricular goals and contents, but also the renewal of pedagogical processes, promotion of cooperation between teachers, and creation of links with the school's interest groups. (Kohonen & Leppilampi 1992, 31, 36-43, 52; cf., for example, Fullan 1991, 47-93; Heikkilä 1994, 243-270.)

According to the contextual learning approach, learning occurs in a context, which by its mere existence helps to structure and direct learning. A context is connected with time and place, and it forms an integrated entirety surrounding the learner's activity. The concept of contextual learning emphasizes the relationships between learning, practices of action, and settings of action. (Kauppi 1993, 54-55, 101.) The trend towards a school culture based on active learning demands of a teacher the ability to expose him or herself to new learning concepts. The teacher should move from reproductive learning to reflective and transformative learning. Reflective

learning requires conscious understanding and internalization of the substructure of the practices of action. Furthermore, essential elements in transformative learning include externalization, construction of a new knowledge base, development of the practices of action, and the redefinition of their prerequisites. Expansive learning linked with transformation refers not only to an individual's internal activity, but also to the external activity which influences the community and society, activity where culture and cognition produce each other. Expansive learning links cognition and activity, thus producing a shared project where culture is regenerated and transformed. (Engeström 1987a, 322; Kauppi 1993, 83-84, 89.) It produces new norms and strategies, and perhaps this is why all transformative learning has, according to Engeström (1993, 9), a feeling of opposing the prevailing norms.

In connection with the second research problem, we will examine the role of the teacher as an active learner in a small rural school. We will also attempt to identify the factors that have shifted the culture of the case study school in the direction of active learning. We will focus on those contextual factors which are related to the nature of the teacher's own learning process. We will pay special attention to the teacher's goal setting, task structuring, accessing of information, processing of work and learning, utilizing the outcomes of work and learning, and assessment procedures.

5.2 Characterization of the main aspects of active learning by teachers

5.2.1 Goal setting

The activity of a school is based on its historically developed culture. The traditions and resources governing activity direct the transformation of curricular goals and contents into pedagogical decisions and patterns of study. Guided by their own theories of practice, teachers can greatly influence the final form of the school's learning setting. (Cf. Argyris & Schön 1976, 6; Brunell & Kupari 1993, 2.) Teacher's practical theories can be seen as a multi-faceted mental structure constructed, among other things, from experiences gained in activity and work, from different

conceptions and reflections related to education, learning, and teaching, and from models of thinking and action. In the case study school the theoretical bases for the teachers' activity can primarily be found in progressive pedagogics. The change from the teacher-directed and textbook-centered teaching styles of traditional pedagogics towards more student-centered teaching methods commerced in the school at the end of the 1980s. From the teacher's point of view, the causes behind this shift in action principles and educational goals can be examined by exploring the different activity environments in which the teacher works, including the micro-, meso-, exo-, and macro-systems, which the teacher actively interacts with.

At the individual level the change in the instructional goals and practices of the school was promoted by the in-service training acquired by the teacher in the case study school. The teacher explained that he had become frustrated and unenthusiastic with regard to conventional school work. In the course of his further study in the area of the educational sciences, he derived new inspiration from encountering alternative pedagogical solutions. The ideas outlined by John Dewey and Rodney Skager especially interested the teacher. At approximately the same time, the threat of school closure receded, and the teacher's position was established as a permanent post, another factor contributing to his willingness to develop his own work.

> In those days I had finished my master's thesis... The reading list for the master's degree was really interesting... It contained a sizeable portion of alternative pedagogics and books on the great trends of this century. (Teacher, male.)

Other changes at the micro-level included the retirement of a long-time teacher of the school and the arrival of a new teacher. The teachers then started cooperatively to plan the renewal of the school's teaching. Moreover, the teacher's wife, who acts as a special teacher at the school, encouraged such experiments with her innovative ideas.

> At that point I used to ponder quite thoroughly what kind of school I wanted to be developing. At the same time people started to talk about integration. My wife became interested in this and got me interested too... I have these discussions with my wife all the time. We reflect a lot together..., and then also a new teacher came here. Our opinions on things are very much alike. That's how we got started with the development work. (Teacher, male.)

Change factors at the meso- and exo-levels included the willingness of the municipal administration and the school board to renovate the school building on the basis of plans submitted by the teacher, instead of closing down the school. The development of the physical and material resources of the school partly contributed to the realization of the new ideas and goals of activity. The municipal school administration and the school board also had a positive attitude towards the new action principles and towards the teaching practices of the teacher. Similarly, the majority of the students' parents and the village community responded positively to the school's pedagogical changes. Some of them, however, expressed the wish that the school should concentrate more on the traditional teaching of basic skills.

> The renovation of the school was the first important phase. We and the school board started to press our ideas in a bigger way than was suggested to us. We went after basic repairs and we did get it through to the implementation phase, after a few years of work... Some of the folks at home keep on being sceptical... They haven't given any reasons for it, but I suppose that new things always cause some suspicion. At the time they went to school in this village themselves, it used to be rather a military-style school. (Teacher, male.)

At the macro-level the renewal of the instructional goals and of the school practices was promoted particularly by changes in the national educational policy. At the end of the 1980s the development work regarding municipal curricula was intensified in Finland. (Cf. Lehtisalo & Raivola 1992, 114-115.) During the same period there emerged new concepts of knowledge and learning, which encouraged teachers to try out alternative pedagogical solutions in their work.

5.2.2 Task structure

The work of a teacher in a small school is broadly-based by nature. The teacher is required to take responsibility for such administrative duties as the budget, the planning of activities and contacts with school administrators, attending meetings of the school board and the teaching staff. The teacher is required to be familiar with matters related to maintenance of the school building and student welfare. He or she must also be capable of functioning as the principal of the school. In addition to scheduled teaching, the teacher's work includes such matters as morning assemblies,

supervision during breaks and school meals, and collaboration between the school and homes. (Kimonen & Nevalainen 1993, 94; cf. Gardener 1986, 117, 123; Kalaoja 1988b, 99-100.) The administrative model of the case study school is very democratic. The teachers' cooperation is both flexible and open. Teachers plan the activities of school together at the beginning of the term and this plan of action is laid out in more detail in the form of weekly plans.

> We have a planning day in the fall and in the spring. It has consisted of putting together the curriculum these last couple of years... The way we run the school, the way we organize free-time and work, that's our business. We are given a budget frame and the school principal is responsible for its implementation. Before school starts in the fall, we work for at least a day. The budget gets done, when it's the time for it. We make the orders for textbooks and materials together around this time in spring... Those decisions that follow the law we make in a certain order. Decisions concerning practical activities are very informal. In other words, it's all very flexible and easy. (Teacher, male.)

The teacher presents to the school board the work plans for the school year and the budget proposals that have been drafted cooperatively. It is the task of the school board to be responsible for the development of teaching and education in the school (cf. Arajärvi & Aalto-Setälä 1993, 182). With this purpose in view, the board has also participated in the construction of the school curriculum. Similarly, the students' parents have taken part in the planning of school work. At parents' meetings they have discussed in small groups, among other things, the goals of the curriculum. On the basis of the parents' proposals, the goal priorities of school activities have been changed in a direction which emphasizes student cooperation.

> The group I do the processing with is the school board... When we started to plan the curriculum, we discussed on the board in small groups, what kinds of values we are going to base this school on... I draft the traditional introduction to the board. We often use group work. It starts us thinking. Then we have the preliminary debate on the matter. They bring up their ideas in a sort of brainstorming session, and in the next meeting we return to the matter... We've had some good parents' meetings on the basis that parents have initially discussed things in groups... The board and parents brought up different things to the ones I had stressed. The emphasis on the environment and nature conservation came from the parents. And another thing they stressed was that a student should learn to face changes. The parents underlined the need for sociability and cooperation with others. This came as a surprise to me; I hadn't thought it would mean so much. (Teacher, male.)

The construction of school-based curricula and the evolution of a new school culture have also created challenges for teacher in-service training. The teacher in the case

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study school has participated in the two-year consultant and work supervisor training program initiated by the university's further education unit. He has also attended a curriculum seminar organized by the National Board of Education.

> I've got the most out of this consultation and work supervision training program, for my work and for other purposes, too. This year our topic has been, to a great extent, small group dynamics. This training is organized by the further education center... Having finished it, I'll be able to act as work supervisor or consultant... I was at the seminar of the National Board of Education, but I didn't think very much of it. My idea of a training event is very different from what went on there. We were sitting in the auditorium and listening to lectures, and nothing necessarily took place in one's head there. (Teacher, male.)

In addition to his teaching work, the teacher has acted as an adult educator. He has led various teacher in-service training events intended for teachers in his own municipality, the neighboring municipality, and the entire province. The primary topic has been the construction of a new curriculum. Being an adult educator has had a central importance for developments in the teacher's own learning processes and for the changing of the teaching practices in the case study school.

> I've acted as the responsible steering person in the curriculum and accountability training organized by the provincial government. It has forced me to rack my brains continuously... The process is based on the idea that first schools construct curricula and then we get together. We always take up some issue which we develop and then the schools put the issues into practice. The idea is that we get to know the tools by which teachers can work at school. It's been a very interesting training process. I found out that, the same way as student-centeredness is rough for a student, it can be rough for the trainees, too. One has to process; it's not enough just to sit there. I've been heading a curriculum planning group in the neighboring municipality all winter. It's meant for the village school teachers... Then we have the common professional days. I don't know about those from a participant's point of view, because I've been leading them for a couple of years. (Teacher, man.)

Changes in school practices and in the settings of action have created many kinds of challenges and problems for the teachers in the case study school which, in turn, have directed the teachers' own learning in a direction which adjusts school practices and generates new ones. Conflicts arising from everyday school activity have also formed a basis for the teacher's learning motivation. (Cf. Kauppi 1993, 89-90.) According to the teacher, he has not had any external incentives, which have encouraged him to develop the teaching. Instead, the teacher's interest in education and in successes with school practices have motivated him in making changes.

> I've always been interested in school and education. It hasn't died at any stage, not yet at least... I haven't got so many external incentives. If I had, I probably wouldn't be here. They can also be found, of course, for it is nice to feel successful, for instance in the educator's job. Working with an adult group is a new area of expertise. It is different in a way, but then again it is very much the same. The learning process is similar, whether it's a question of a child or an adult. (Teacher, male.)

5.2.3 Accessing information

Teacher's work involves a process of continuously accessing information. The teacher requires resources by which he/she can access information in teaching situations and, therefore, he/she further develop his/her own work. This continual accessing of information also concerns the accumulation of information related to the teaching profession and the learning of new ideas. (Niemi 1992, 13.) Teachers often receive information literature, and most attend workshops, but they do not have the opportunity for continuous personal contact, which is necessary prerequisite for becoming aware of and following up innovative ideas (Fullan 1991, 53). Professional isolation is often the problem, especially with teachers in small rural schools, giving rise to routinism in work and reducing contacts with other teachers (cf. Kalaoja 1988b, 70-71; 1990a, 53-60). More effort is required of rural teachers than of urban teachers in the acquisition of information about new innovations. The current in-service training of teachers is not appropriate in term of content or of method with regard to teachers' work in small rural schools. For example, nearly one third (= 56) of small school teachers in Northern Finland reported that they had not received any in-service training connected with small schools, and about two thirds of them felt that they had received only limited amounts of appropriate in-service training relating to their work. Nevertheless, about two thirds of small school teachers in Finland felt that they required relevant in-service training for their work. (Kalaoja 1991, 101, 113.)

The teacher in the case study school has participated in courses organized by the university's further education unit and by the National Board of Education, as well as acting as an educator himself in in-service training arranged for teachers. He

regularly reads educational books and journals. Also other literature has inspired his work. By contrast, the materials provided by the National Board of Education have not finished him with ideas. The teacher has also accessed information through discussion with other teachers, students' parents, board members, and with his wife who acts as a special teacher. Naturally, he has gained a great deal of knowledge through his 15 years of teaching experience.

> I've lately found many relevant points in literature, for example, in Steinbeck's Cannery Row. It had a very telling description of a person who has gone through our present school system... The National Board of Education functions so far away, after all. It's very hard to make generalizations and give directions from there, which have an effect on everyday life in schools. I can't get out much of those materials. I read the Finnish Journal of Education. The Teacher's Journal I read when there happens to be something worth reading. (Teacher, male.)

5.2.4 The process of work and learning

Adoption of new patterns of thought and working practices involves an intensive, comprehensive process of work and learning for the teacher (cf. Niemi 1992, 8-10). According to Fullan (1991, 326-327), the teacher as learner is central to transcending the dependency faced by teachers as they attempt to cope with streams of innovations and reforms constantly trust at them. Educational reform will never amount to anything until teachers become inquiry oriented, skilled, reflective, and collaborative professionals. According to the teacher in the case study school, the instructional practices of the school are in a process of continual development. He also wants to develop himself, his teaching, and his teaching materials continuously. For example, the teachers in the school have created themselves the teaching materials needed in mother tongue and mathematics lessons, because the available textbooks do not totally correspond to their action principles.

> There are moments when you wonder, whether this is right after all. So far, I've been able to change, and I hope that I'll be able to change still, since I don't believe that we are making any final system here. It keeps on developing. (Teacher, male.)

Feelings of suspicion towards innovations, insecurity, awareness of risk, and the temptation to return to former practices are also connected with the process of change. Successful change presupposes that the teacher is able to influence events actively, reflect on his/her experiences, and receive support for such reflections.

(Niemi 1992, 10; cf. Niemi 1993, 33-35.) Changes require support from the parents of students, from other teachers, educational authorities, and from representatives of professional organizations. The majority of the students' parents in the case study school are satisfied with the practical methods adopted by the school. Similarly, teachers from other schools in the municipality are interested in the school's teaching practices, although their own teaching has, up till now, been along fairly traditional lines. In contrast, the authorities of the school administration and the representatives of the teacher union have not commented the innovations of the school in any way.

> Teachers in the other schools have been interested in pedagogical matters related to teaching. A significant change has taken place in thinking... We discussed this in the parents' meeting, and the parents thought that this is definitely such a good system that it must definitely be kept going... The authorities take no stand on it... The professional organization probably has other reasons for not having interfered with this. No message has come from there. (Teacher, male.)

In the small case study school the process of change from a traditional school to a school applying the principles of progressive pedagogics proceeded in phases, by means of the experiences gained by the teachers in their practice and through the discussions held on the basis of these experiences. During the first phase of the change, the teachers began working with topic units lasting for 1 - 2 weeks. At the same time, they dismantled the system of teaching based on contact hours. During the second phase, the teachers increasingly stressed the need for activity-oriented learning in their teaching. The duration of the topic units was extended, in order to allow more time for the students' own project work and to allow them to go into greater depth. During the third phase, the teachers extended the school day, so that school started and ended at the same time every day.

> We've been doing this change bit by bit, the whole time. We've not made any sudden changes. One of the most important changes was that I broke the 45-minute teaching system and built larger systems...First came the construction of project units. At first, the units were shorter, a week or two... Then I extended the periods to make activity-oriented learning possible, and so that we could deal with things more deeply... Students were given time for their own project work. The final product is the matter I've tried to deepen all the time. The activity-oriented learning revealed that the Finnish school practice does not make this system possible. That's when we gave up this school day that is tied to a strict number of hours. (Teacher, male.)

Changes in the teacher's process of work and learning has proceeded in phases in the case study school. The process has continued inductively through the

comparison of individual experiences which leads to a decision of action. During the initiation phase of the change process, the teachers observed the needs for changes in the school curriculum, in the practices of action, and in the setting of action. They designed changes and tried out different realizations. Experiences gained during the implementation phase were analyzed with the school board, and the most essential features of the changes were described in the parents' meetings. The models of action were compared, and their success was evaluated. During the continuation phase the observations and experiences gained over approximately five years, concerning the strengths and weaknesses of the process of work and learning, were thoroughly discussed in teachers' joint meetings. Finally, the new curriculum of the school was constructed. This innovation process was, of course, facilitated by the decisions of the central educational administration. (Cf. Fullan 1991, 47-48; 1992, 96-97; Malinen 1992, 90-93.)

5.2.5 Utilizing the outcomes of work and learning

Many new ideas and trends have been introduced into rural areas through the teacher. Through his activity the teacher has enlivened the life of a village community. During the early decades of our school system especially the teacher acted as a leader and inspirer of various cultural activities in the village community, in addition to his regular work. The teacher often became the leading figure of the municipality and the village, holding many confidential posts. (Halila 1949a, 362; 1949b, 292-298; 1949c, 121-123; 1950, 273-279.) At present the life style of the village community, the school culture, and the teacher's personality influence the role of a rural teacher. For example, nearly 70 per cent (53 in all) of small school teachers in the province of Oulu considered the participation in village activities an integral part of the role of a rural teacher, and about 40 per cent felt that it was the teacher's duty to organize the leisure-time activities in the community. The fact that teachers increasingly live outside villages nevertheless tends to be a barrier to the realization of such a comprehensive role. (Kalaoja 1988b, 81-86, 113; cf. Forsythe 1983a, 104-106; Forsythe & Carter 1983, 160-162; Kimonen & Nevalainen 1993, 103; Lauglo 1984, 91-99.)

The teacher in the case study school has been an agent of change primarily by reporting to the teachers of the municipality and the whole province about his own experiences and observations as an implementor of the school-based curriculum. He has not, however, wanted to present the teachers a prepared model of action. Instead, he has offered them an opportunity to develop their own readinesses, metacognitions, in constructing a goal-oriented curriculum. The school has also been open to teachers and university students who wish to become acquainted with the cooperative project work in combined grades. In addition, the teacher has acted in his own village community, among other things, as chairperson of the youth association and leader of the drama circle.

> I hold the principle that I never offer any ready-made model. And I don't want to market this as any final model, either. I feel that it is more important that they learn to realize that they can remake their systems by themselves... There have been visitors here at the school. They've come here in order to learn. The visits have lasted from a few hours to a full day. (Teacher, male.)

5.2.6 Assessment

5.2.6.1 School self-evaluation

Purposeful reform of the school presupposes continuous evaluation regarding the implementation of curricular goals and their functioning. According to the Fundamentals of the Comprehensive School Curriculum (1994), the purpose of systematic evaluation of school functioning is to raise awareness of the condition of the school and its development needs and to enhance the realization of the profile sought by the school. The target of school self-evaluation is the successful functioning of the school as an environment for cooperation, education, and learning. Teachers, students and other members of the school community, students' parents, and other interest groups outside the school may participate in such evaluations. (Peruskoulun opetussuunnitelman perusteet 1994, 22; cf. also Hopkins 1992, 184-192; Lyytinen 1993, 114; Vanne 1994, 134-140.)

The teachers in the case study school annually evaluate the functioning of the school together with parents and members of the school board. Periodically the teachers

also send parents a questionnaire concerning school activities, by means of which they aim to survey the parents' views of the school's strengths and weaknesses (TABLE 14). Parents' attitudes to changes in the school's practices vary. The majority of them have a positive view of the school's new principles of action, while some have expressed no opinions, and a few criticize some areas of activity. The parents are especially satisfied with aspects connected with the context and resources of the school. Positive views center, among other things, on the motivating and secure atmosphere of the case study school (cf. Kalaoja 1990a, 96-97). The modern and appropriate teaching facilities, equipment, and materials of the school also improve the atmosphere. Furthermore, the high level of education and long professional experience of the teachers are seen as positive factors. According to parents, the teaching methods of the school are various and based on the activation, cooperation, and the independent initiative of students. The school is a well functioning and developing whole. Nevertheless, some of the parents feel that, among other things, the school should further develop individual guidance, group division, the flow of information to students' homes, and evaluation procedures.

> We have competent teachers... This is a small, pleasant school... You can get individual teaching here. Here it is easy to find the areas where the child is strong. It is easy to support that side, too. (Chairperson of the school board, female.)
>
> I observed them during the excursion last spring, and they seemed just like one family. The bigger ones didn't tease the first graders, nor were girls teased, or anything. They even sat on the bus next to each other, regardless of whether they were next to a girl or a boy or a sixth grader... Maybe this group work has done it. You must take the smallest ones into account as well. (Student's mother 1.)
>
> Leaving for school has been so much fun. It's never happened that they won't go to school. (Student's father 1.)

TABLE 14. Parents' views concerning the strengths and weaknesses of the case study school, according to the survey made by the teachers

Strengths of the school	Weaknesses of the school
CONTEXT - positive and pleasant atmosphere - spirit of togetherness - flexibility - openness - no teasing in the school - safe school journey - safe school yard - adequate number of students - students' high level of motivation for school	
RESOURCES - good facilities and equipment - skilful and friendly teachers - teachers' freedom from prejudice - active students	
PROCESSES - school functioning as an entity - developing school - varied teaching methods - cooperative project work - workshops - topic units - search for information - encourages individuality - encourages independent initiative - student activation - cooperation with homes	PROCESSES - learning contracts in mathematics - number of field trips - group divisions - individual guidance - class discipline during group work - evaluation procedures - flow of information home

The teacher emphasizes the procedural features of learning in his evaluation. According to the teacher, the new methods of work which activate students have increased students' responsibility for their own work. Students have learned to value project work as an important part of school work.

> Responsibility for their own work has increased. The appreciation of the project work has increased and it has grown to be an ever more important part of this school... If we think only about the final results, these products aren't so terrific. But some pearls pop up among them, more and more often. (Teacher, male.)

The outcomes of school functioning are also evaluated, when students transfer from the small village school to the upper level school in the center of the municipality. At the upper level the school culture changes from the comprehensive and activity-oriented pedagogics of the lower level to the more fragmented teaching of different school subjects. According to the teachers, the students in the case study school have performed at an average level when they move to the upper level. However, the information that teachers receive about students' performance in the upper level is rather limited and is only conveyed through a number of parents.

> They've been doing rather average. No great differences can be observed... They have many social skills, which are not needed in the upper level. It is, of course, subject teaching there. In their work places they will need social skills... However, we don't work here on the upper level's terms. We must see beyond the upper level... One mother said that her child finds it hard to sit in his place. I understand that, because the learning style there is very passive. If student learns an active style here, it is naturally hard to get used to that passive one. (Teacher, male.)

5.2.6.2 Teacher self-assessment

Changes in school practices necessitate teacher self-assessment and critical reflection. In the teacher's learning process reflection mainly involves the conscious understanding and internalization of the basis for the practices of action. The teacher should be capable of observing his/her own practices, utilizing the feedback received from the activity, recognizing his/her own cognitive and metacognitive strategies, and he/she should also be capable of autonomic problem solving. Reflectivity by itself does not, however, contain the aspiration for change. The development of new models of thinking and action requires, not only reflective learning, but also transformative learning. (Kauppi 1993, 83-88; cf. Calderhead 1993, 20-21; Kemmis 1987, 75; Miettinen 1990, 145-147; Niemi 1993, 42.)

Directed by his/her own practical theory, the teacher reflects on the learning practices and on the learning environment of the school. According to the teacher in the case study school, his own theory of practice took shape a long time ago. The first principle of this theory is to perceive the matters to be studied as having a global significance. The teacher sees the development of a student's world view as

advancing in expanding circles. Thus, through familiarization with the immediate environment, students finally achieve a global style of thinking. According to the second principle, the matter under study should be seen in their temporal and historical perspective. The third starting point involves the recognition of a student's individual level of development and his/her capabilities. According to the teacher, the school should develop the individual abilities of each student, without comparing them with the abilities of other students. Fourth, the school should teach topics which interest a child. At the same time, the student's own responsibility for his/her learning increases.

> The issues that we study should be connected with the immediate environment, so that these metacognitions can be learned... Contents are also seen globally and, on the other hand, also from a historical perspective... Every individual starts from his own level of development in a learning situation...The school should promote each learner's abilities... The students' world may be compiled of things other than those we discuss at school... We must have subjects that interest the child. (Teacher, male.)

According to the teacher in the case study school, the educational policy of Finland, however, prevented him from carrying out his own principles of education until the late 1980s. The means and resources for the realization of these ideas did not exist. In the centralized school culture, even at its best, the problems that emerged in the context of the school were accepted rather than questioned. The decline of the centralized policy of education gave the teacher an opportunity to develop his own school culture more actively. In the case study school the changes in school practices lead to the break-down of the traditional school context. The many contradictions that appeared in the practices forced teachers to define a new type of school context, while also helping to motivate teachers' learning process.

> My own philosophy of education has been formed a long time ago. I've lacked the means to put it into practice, and the resources. The administrative bureaucracy of this country has been so effective in suffocating these things. It would have taken a terrific amount of energy, if I had begun these changes earlier. At the end of the 1980s the administrative system started to become freer, and then it was much easier to begin these changes. Also a phase arose in my personal life that allows me to give my full input to the work. (Teacher, male.)

During the process of change in the case study school the perception of learning in terms of holistic entities and the increase of activity-oriented practices emerge as central concepts. The holistic approach and activity have evolved from dialectical

interaction. The purpose of the change process has been to create educational situations, where students are given the opportunity to see the studied phenomena in relation to larger entities. The perception of these entities clarify the meanings of concepts in active work. The teacher recalled it was difficult for him at first to perceive how active this active learning should be. Because the activity is in itself truly challenging for some students, the aim was to stimulate the degree of activity that is commensurate with the personal abilities and characteristics of the students. According to the teacher, active learning has given rise to many positive features in students' work. For example, the students' sense of responsibility and their independent initiative have increased.

> It's been troublesome to fully understand this activity-oriented learning. This system is hard for the student. In certain topics and at certain points I have overestimated a student's capacity. I'm satisfied with this increased sense of responsibility. (Teacher, male.)

At present the Finnish school administration strongly emphasizes the openness and self-directedness of schools, in which class teachers are motivated to adopt an increasingly firm management of their own work. Also stress is laid on the continuous development of the curricula. It is through teachers that school system will become renewed. (Lindström 1993, 47-48.) This national set of policies assigned to school education are endorsed by the case study school. In the future, the teacher would especially like to increase the role of computer-aided instruction and outdoor/environmental education in his school. According to the teacher, a school as a functional system is never ready. Development presupposes that the teacher continuously and critically reflects on and transforms his own principles and practices of action.

> This system is never ready, and will never be ready, therefore we must think about it all the time... we could utilize the environment even more in learning. Learning should be natural, we should examine the environment and things, we should ask the other people who know, and not always the teacher. We should learn to benefit from different channels of learning. One channel could be the utilization of computer technology. Computer technology will be one of the developmental targets in the future. (Teacher, male.)

5.3 In conclusion

Above we have examined the role of the teacher in a small rural school as an active learner in school work and in tasks outside the school. We have analyzed aspects that have changed the context of the school, the action principles and practices of the teacher. We have directed attention towards the teacher's active transformative learning, especially in the setting of goals, task structure, accessing of information, processing of work and learning, utilization of the outcomes of work and learning, and the teacher's self-assessment.

The process of change from a traditional school culture to a progressive culture started in the case study school at the end of the 1980s. The renewal of the instructional goals and practices of the school was promoted by changes in the national educational policy and the emergence of new, constructivist conceptions of knowledge and learning (cf., for example, Lindström 1993, 41-46; Pässilä & Niinikuru 1993, 133). At the school level, the change was accelerated by the renovation of the school building, launched instead of the intended closure of the school, and by the educational discussions between the teachers. At the individual level, the teacher's long work experience, and the in-service training he acquired, promoted changes in the instructional goals and practices of the school. (Cf., for example, Hargreaves 1994, 435-436; Johnston 1994,199-208; Elliott 1994, 43-69; Ross 1994, 389-392.) The teacher has also participated in courses organized by the university's further training unit and by the National Board of Education and acted as an educator in teacher in-service training. The teacher's own theory of practice emphasizes a global style of thinking and a historical dimension, as well as acknowledging students' abilities and interests.

The process of change in the school has proceeded inductively, in phases, by means of the practical experiences of the teachers and the discussions relating to these experiences. During the first phase of the change they introduced the topic units. During the second phase, teachers wished to stress the activity-oriented learning in their teaching, and during the third phase, the duration of the school day was extended. These challenges and problems arising from the everyday activity of the

small rural school have formed the basis of the teacher's learning motivation. In addition, the teacher's own interest in education and wish to improve school practices have motivated him for change. Furthermore, the fact that the teacher has acted as an adult educator, has been central in changing the teacher's own learning process and the teaching practices of the case study school. The new methods of work which are based on active learning have increased the students' responsibility for their own work. Students have also learned to appreciate project work as an important part of school work. Active learning has brought out many positive characteristics in students' work, including the development of independent initiative. Active learning has expanded the teacher's role. As an agent of change he has presented his experiences and observations as the implementor of the school-based curriculum to other teachers from the municipality and from the whole province.

Changes within the school require the teacher to continually reflect on his/her own principles and practices of action and then to renew them. The reformation of work and the management of change offers a comprehensive learning process for the teacher. On the one hand, the teacher internalizes the prevailing school culture and, on the other, he continually transforms it by means of externalization (cf. Engeström 1992, 15-17). The learning process of the teachers in the case study school consisted of reproductive learning which took place in a traditional school culture, up until the end of the 1980s. The teachers reacted to changes in the internal and external action environment of the school mainly by identifying and correcting its defects. Concurrently, they maintained the central models of thinking and action which were based on the behaviorist learning concept. The essential purpose of such single-loop learning is to perpetuate the prevailing school practices and routines. (Cf. Argyris, Putnam & McLain Smith 1985, 85-88; Kauppi 1993, 79.) By contrast, the new school culture based on progressive pedagogics presupposes transformative learning. In order to be able to change the context of the school, the teacher needs new patterns of thinking and action. Thus the transformation of the bases of action becomes a double-loop learning process for the teacher. (Cf. Argyris at al. 1985, 85-88; Kauppi 1993, 87.) Table 15 summarizes our observations regarding the teacher's active learning in the case study school.

TABLE 15. Main findings regarding active learning by teachers in the case study school

ASPECTS OF ACTIVE LEARNING BY TEACHERS	FINDINGS
Goal setting	- The process of change from a traditional school culture to a progressive culture began in the case study school towards the end of the 1980s. At an individual level, the transformation of the instructional goals and practices in the school was promoted by the in-service training acquired by the teacher. At the micro-level, the change was accelerated by the arrival of a new teacher at the school and by the discussions which took place between the teachers concerning education. The most important of the factors on the meso- and exo-levels was the mental and material support offered by the different interest groups at the school. On the macro-level, the renewal of the school's instructional goals and practices was promoted by the reform of the national educational policy and the emergence of new conceptions of knowledge and learning.
Task structure	- The work of the teacher in the small school is broadly-based by nature, and the administrative model of the school is very democratic. The cooperation between the teachers is both flexible and open. The teachers plan the activities of school together, at the beginning of the term. The school board and the students' parents also participate in the planning of school work. The challenges and problems arising from everyday school activity and the teacher's own interest in education form the basis for the teacher's learning motivation. The teacher's work as an adult educator is also central to changes in the teacher's own approach to learning and the teaching practices of the case study school.

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TABLE 15. (Continued)

ASPECTS OF ACTIVE LEARNING BY TEACHERS	FINDINGS
Accessing information	- The teacher has participated in courses organized by the university's further training unit and the National Board of Education and acted as a leader in teacher in-service training. He has gained incentives for school work from books on education, educational journals and other literature. He has also accessed information through discussions with other teachers, students' parents, and members of the school board. Naturally, his long experience as a teacher has endowed him with experience-based knowledge.
Process of work and learning	- Changes in the teacher's approaches to work and learning processes proceeded inductively in phases, through the teacher's individual experiences, to decisions of action. During the first phase of the change topic units were adopted. During the second phase teaching was developed in a more activity-oriented direction, and during the third phase the duration of the school day was extended. The teaching practices of the case study school develop continuously. The teacher develops himself, his teaching, and his teaching materials.
Utilizing the outcomes of work and learning	- The teacher in the case study school is an agent of change mainly, when he teaches about his own experiences and observations as an implementor of the school-based curriculum to other teachers from the municipality and from the whole province. The school is open to teachers and students, who wish to become acquainted with the cooperative project work carried out in combined grades. In addition, the teacher participates in the cultural activities of his own village community.

TABLE 15. (Continued)

ASPECTS OF ACTIVE LEARNING BY TEACHERS	FINDINGS
Assessment	- The teachers in the case study school evaluate the school's functioning with the students' parents and the members of the school board. The new working methods that involve activating the student have increased the degree of responsibility students take for their own work. They have learned to appreciate project work as an important part of school work. Active learning has given rise to many positive features in students' work including an increase in independent initiative. The majority of the students' parents have a positive attitude towards the new principles of action adopted by school. According to the case study school teacher, his own theory of practice emphasizes global thinking and the presence of a historical dimension and the acknowledgement of students' abilities and interests. According to the teacher, school as an functional system is never complete. Development requires the teacher to continuously critically reflect on and transform his/her own principles and practices of action.

6 CONCLUSIONS

The purpose of this study is to describe, what is meant by active learning in a small rural school. The aim of the study is to describe, what is meant by active learning for students (chapter 4) and for teachers (chapter 5). In the following chapter we will examine the relationship between active learning of students and of teachers. The aim is to comprehensively outline the interrelationship between the action practices and models of students and those of teachers in a small rural school, on the basis of the present inductive-deductive case study.

> In order to learn about life and people, the case study researcher is not satisfied merely to glance into the lighted windows of a passing train. Instead, he/she stops the train and starts on a common journey. (Syrjälä & Numminen 1988, 185.)

6.1 Basic features of active learning by students and by teachers in the case study school

6.1.1 The organization of goals and tasks

All systematic teaching and study is founded on a conception as to the nature of learning and of the learning situation. This conception is constructed, among other things, from conceptions about human knowledge and mental processes, from societal traditions and norms, and from the expectations set for teaching by society. (von Wright 1993, 1.) Paradigmatic changes in the conception of learning can form national educational policy and in this way may be also reflected in the practices of individual schools. Transformation of the national educational policy can facilitate the autonomous developmental work of schools. The process of change from a traditional school culture to a more progressive one began in the case study school in the late 1980s. This reform of the instructional goals and practices of the school was promoted by new, constructivist conceptions of knowledge and learning that emerged in Finland at about the same time. According to these conceptions, knowledge is constantly changing, and personal experience and structuring are required in order to comprehend such knowledge. The new approach to the

curriculum also gave more freedom to the school. The basis of this new thinking is that the national curricular goals can now be realized in school-based goals within the curricula of individual schools. It is the responsibility of the teachers to decide, how they will attain these goals. (Cf. Lindström 1993, 43-44.) The transformation of the instructional goals and practices in the case study school was promoted at an individual level by the in-service training acquired by the teacher in the school. He then became interested in the educational ideas especially presented by John Dewey. On the micro-level, the change was accelerated by educational discussions with his wife who acts as a special teacher and with the new teacher of the school (cf. Stern 1994, 25, 29). In setting new educational goals, teachers, however, often need also the support of school's interest groups (cf. Hulbert Holly & Walley 1989, 297). Among the meso- and exo-level factors supporting the thinking of the teacher in the case study school, the most significant was the renovation of the school, which took place rather than the threatened closure of the school. In the planning of the renovation he was able to reflect on new educational ideas. In addition, the majority of the students' parents and members of the community had a positive attitude regarding the pedagogical changes in the school.

The teacher's educational goals and action principles, which emphasize students' freedom of choice during the learning process, are clearly reflected in the practices of the case study school. During the cooperation phase of the learning process arising from the project work, students were also allowed to set their own objectives for activities and to observe their achievements. (Cf. Kyriacou 1992a, 310.) During the cooperation phase the students had an active role characterized by goal-oriented, self-assessment activity directed by metacognitions (cf., for example, Driver 1988, 138; von Wright 1993, 27-28; Watts 1991, 91-92). The teacher determined what the students had to study during the week, but the student groups had the main responsibility for the way in which they achieved the defined goal (cf., for example, Platz 1994, 420).

The work of a teacher in a small school is by nature broadly-based (cf. Kalaoja 1988b, 99-100; Kimonen & Nevalainen 1993, 94). The challenges and problems arising from the miscellaneous activities of the case study school's everyday life, as well as the

teacher's own interest in education have formed the basis for the teacher's learning motivation. Furthermore, acting as an adult educator has been central in the development of his own approach to learning and in the transformation of the instructional practices of the school. Correspondingly, the teacher's commitment to the development of the school and his success in practical educational situations have motivated him to shift the emphasis of his own work onto student activeness (cf. Stern 1994, 1, 4). During the research period, the teacher's activeness was evident mainly in the orientation and evaluation phases of the learning process arising from of the project work. During the cooperative phase of the work he guided and encouraged students. (Cf., for example, Keiny 1994, 159; Page 1990, 78-79.)

Cooperation between the members of the school community and the representatives of the school's interest groups was evident in the action practices of the school. The students practiced cooperative learning in small groups composed of students of different ages. The strength of these small groups consisted of their naturalness (cf. Slavin 1991, 80-81; 1992, 333). During the cooperation phase special emphasis was placed on students' independent initiative, sense of responsibility, and cooperativeness (cf. Jaques 1991, 98-99; Kyriacou et al. 1990, 1-2). The most problematic elements arising from the activity of the heterogeneous small groups were the defectiveness of cooperative skills and information processing skills. The students' level of concentration also varied according to age. The cooperation between the teachers has been both flexible and open. The teachers has planned the school activities together at the beginning of the term. Also the school board and the parents have participated in the planning of school work. Our observations regarding the active learning of students and teachers in goal and task organization in the case study school have been summarized on Table 16.

TABLE 16. The main features of active learning by students and by teachers in goal and task organization

ASPECT OF ACTIVE LEARNING	ACTIVE LEARNING BY STUDENTS	ACTIVE LEARNING BY TEACHERS
Goal setting	G1 During cooperation the students had an active role characterized by goal-oriented, self-assessment activity, directed by meta-cognitions. G2 Students were also allowed to set their own objectives for the activity and follow their achievement. G3 Student groups bore the responsibility for the course of action with which they achieved the defined objectives.	G1 The process of change from a traditional school culture to a more progressive culture started at the end of the 1980s. G2 Transformation of the instructional goals was promoted by: - in-service training - discussions with teachers - discussions within the school board - renovation of the school instead of closure - transformation of the concepts of knowledge and learning - reform of national educational policy.
Task structure	T1 The strength of the groups composed of students of different ages was their correspondence to life situations outside school. T2 During the cooperation phase stress was laid on the students' independent initiative, sense of responsibility, and cooperativeness. T3 The problems with the heterogeneous groups consisted of the defectiveness of cooperative skills and of information processing skills, as well as great differences between the group members in concen-trating.	T1 The work of a teacher in a small school is by nature broadly-based. T2 The challenges and problems arising from the everyday activity of the school and an interest in education have formed the basis for the teacher's learning motivation and consequently encouraged him to change his own work. T3 Acting as an adult educator has been central for the change of the teacher's own learning process and for the transformation of the instructional practices in the school. T4 In the project work the teacher's activeness was evident in the orientation and evaluation phases of the learning process. T5 At the beginning of the teaching unit the teacher presented the objectives, topics, and methods of work to the students. T6 During the activity he guided and encouraged the students. T7 At the end of the project work he also gave students feedback on their activity.

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6.1.2 The processes of work and learning

The process of change in the case study school proceeded inductively in phases, by means of the experiences the teachers gained in practice and through discussions they had concerning their work. During the first phase of the change, the teachers adopted topic units lasting from one to two weeks. During the second phase, the teachers increasingly stressed activity-oriented learning in their teaching. During the third phase, the teachers extended the duration of the school day. The teachers at the case study school aim to continuously develop their teaching practices. The teachers also want to develop themselves, their teaching, and their teaching materials.

During our research period the learning process arising from the project work consisted of the orientation, cooperation, and evaluation phases. The teacher's role in the learning process was developmental, as he was seeking to develop his students as learners (cf. Keiny 1994, 159). The teacher's essential tasks in the orientation phase included student motivation and instruction giving. During the cooperation phase he actively gave advice and patiently guided the activity of the small groups. During the evaluation phase the teacher examined the outcomes with the students and later he also wrote feedback concerning students' outcomes and cooperative skills. (Cf., for example, Johnson et al. 1990, 43; Olkinuora 1994, 68; Page 1990, 78-79.) The project work carried out in small groups offered the students the opportunity for active interaction with one another and for solving the problems that emerged from working together. (cf., for example, Jaques 1991, 98; Kyriacou 1992b, 42). The most problematic aspects of the group work were the lack of negotiation and conciliation skills, and the passivity of the youngest group members, especially in the planning of the work. Problems were also common in the processing of information. The students selected, grouped, classified, and interpreted information in a minor way (cf. Watts 1991, 41-42). They were also satisfied with fairly routine solutions. It seems that the simultaneous mastery of the social and cognitive goals set for small group work is a demanding challenge for students in the active learning process of project work.

In order to acquire new information for the construction of his models of thinking and action, the teacher needs new knowledge (cf., for example, Hargreaves 1994, 435-436; Johnston 1994, 199-208; Elliott 1994, 43-69; Ross 1994, 389-392). The teacher in the case study school has participated in courses organized by the university further education unit and by the National Board of Education and he has acted as an educator in teacher in-service training. He has found inspiration for his school work from educational books, journals, and other literature. He has also accessed information through discussions with other teachers, students' parents, and members of the school board. Naturally, the teacher has gained a considerable amount of experience-based knowledge through his long professional experience. In his own teaching the teacher usually utilizes the opportunities provided by the immediate environment of the school (cf. Kalaoja 1990a, 48, 68-69, 90). He also seeks continuously to direct his students in accessing information from various sources both indoors and outdoors. Table 17 summarizes our observations regarding the active learning of students and teachers during the process of work and learning in the case study school.

TABLE 17. The main features of active learning by students and by teachers in the process of work and learning

ASPECT OF ACTIVE LEARNING	ACTIVE LEARNING BY STUDENTS	ACTIVE LEARNING BY TEACHERS
Process of work and learning	P1 In the learning process of the project work a number of phases were identified: orientation, cooperation, and evaluation. P2 During the project work the students actively interacted with one another and cooperatively solved the problems that emerged from the task. P3 The essential tasks of the teacher during the orientation phase included motivating student and giving instructions. P4 During the cooperation phase he offered advice and guided the activity of the small groups. P5 During the evaluation phase the teacher examined the learning products with the students and later gave written feedback.	P1 The process of change at the school proceeded inductively, in phases, by means of the experiences the teachers gained in their working practice and through discussions about these experiences. P2 During the first phase of the change the teachers introduced study units. P3 During the second phase the teachers wanted to develop a more activity-oriented form of teaching. P4 During the third phase the teachers extended the school day. P5 The teachers in the case study school seek to continuously develop their teaching practices. The teachers aim to develop themselves, their teaching and their teaching materials. P6 In the teaching situations the teacher's role was developmental, aimed at developing his students as learners.
Accessing information	I1 The students of the case study school are used to accessing information from many different sources from within and from outside the school. I2 Students have obtained information by reading books, interviewing experts, and by observing and investigating their environment.	I1 The teacher has accessed information by participating in courses and by acting as an adult educator himself. I2 He has gained incentives for his work from educational books, journals, and other literature. I3 He has also acquired information through discussions with other teachers, students' parents, and members of the school board. I4 His professional experience as a teacher has naturally provided him with considerable experience-based knowledge.

6.1.3 Utilizing and assessing the processes and outcomes of work and learning

The Finnish school has developed as an institution which is separated from the rest of the world, and, consequently the utilization of the school outcomes for purposes other than learning has generally been rather uncommon. However, a small rural school has traditionally been involved in the life of the village community (Bell & Sigsworth 1987, 207-214; Forsythe & Carter 1983, 165-167; Gulliford 1991, 79-89, 124-125; Pirhonen 1993, 51-61). The products of the students in the case study school are utilized to some extent in the activity of the school and the surrounding community. The teacher has, for his part, acted as an agent of change mainly by offering other teachers from the municipality, and from elsewhere in the province, an account of his own experiences and observations as an implementor of a school-based curriculum (cf. Stern 1994, 34). The school has also been open to teachers and university students, who have wished to become acquainted with cooperative project work in combined grades.

The evaluation practices of the case study school mainly follow the evaluation principles outlined in the new Finnish curriculum. The assessment of the learning process and outcomes is continuous within the school. During the evaluation phase of the learning process, special attention was paid to areas in which students were successful. Nevertheless, the achievement of social objectives was not discussed; instead, the teacher gave a written assessment of the cooperation skills displayed by each student in their personal study-books. The students also evaluated their own learning activities and results in their study-books, but they were not, however, instructed to carry out assessment of the group work. Nor did they consciously assess one an other's products or cooperation processes. (Cf. Johnson & Johnson 1992, 69.)

The teachers in the case study school evaluate the functioning of the school annually, together with parents and the members of the school board. According to the teacher, the new work and learning methods which activate students have given rise to many positive characteristics in students' work including increased initiative and a growing sense of responsibility. The students have learned to appreciate project

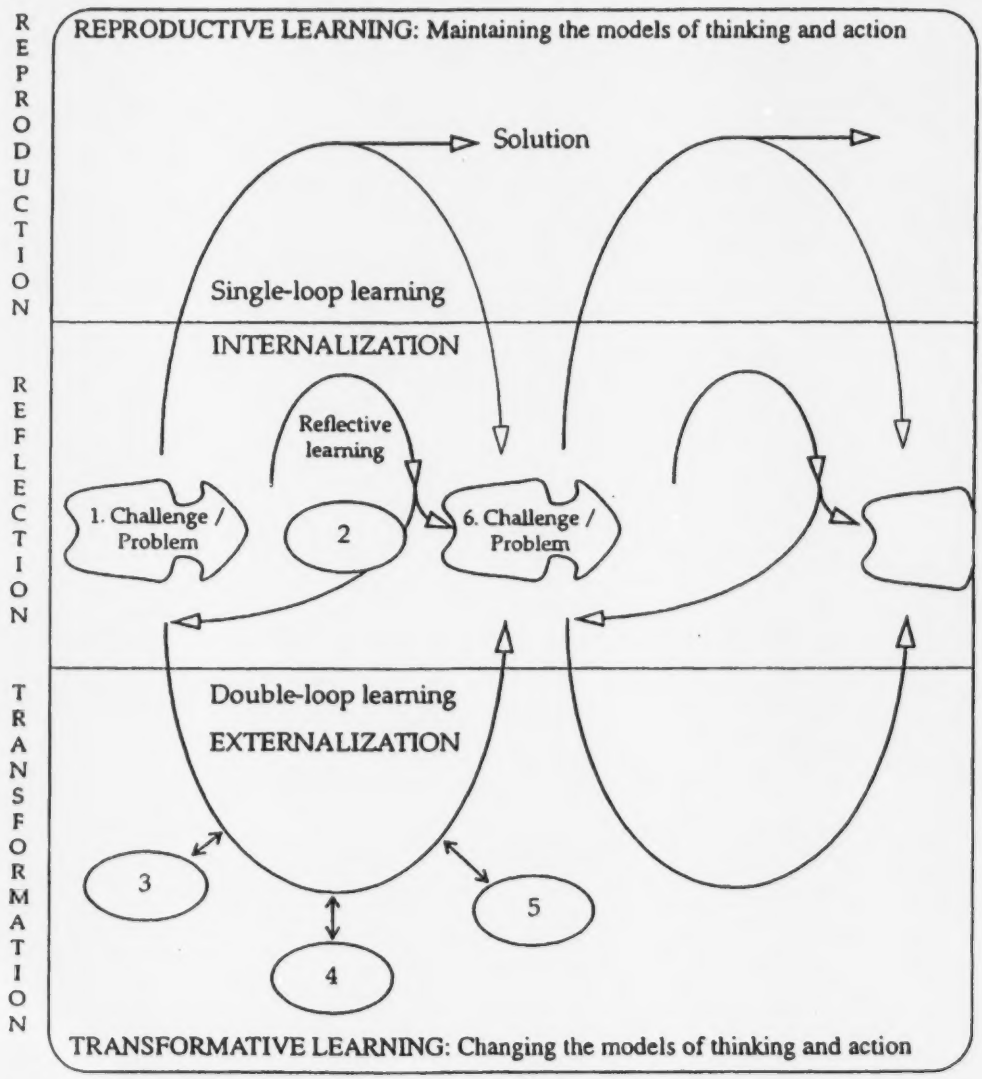
work as an important part of school work. The theoretical basis of the teacher's work which emphasizes a *global* and *historical mode of thinking*, and acknowledges student abilities and interests, reflects an internalized overall view of holistic education and constructivist learning. According to the teacher, the school as a functional system is always in a state of development. Transformation demands of the teacher continuous critical reflection and the renewal of his/her own principles and practices of action. Table 18 summarizes our observations concerning the active learning of the case study school's students and teachers in the utilization and assessment of the processes and outcomes of work and learning.

TABLE 18. The main features of active learning by students and by teachers in the utilization and assessment of the processes and outcomes of work and learning

ASPECT OF ACTIVE LEARNING	ACTIVE LEARNING BY STUDENTS	ACTIVE LEARNING BY TEACHERS
Outcomes of work and learning	O1 Students' project outcomes are utilized to some extent in the activities of the school and in the surrounding village community: - Students' products are often published in the local newspaper. - Students usually perform in the parties of the village community. - Students participate in events organized by the village committee, such as the annual voluntary cleaning up of the roadsides.	O1 The teacher has been an agent of change affecting school culture by describing to other teachers his experiences and observations as an implementor of a school-based curriculum. O2 Other teachers and university students have become acquainted with the activity of the school. O3 The teacher has participated in the cultural activities of his own village community. O4 The school is the meeting place of the village community.
Assessment	A1 The teacher, student and his or her parents evaluated the student's learning. A2 Methods of work and learning based on active learning have developed many positive features in students, including increased initiative and a growing sense of responsibility. A3 Students have learned to appreciate project work as an important part of school work.	A1 The teachers in the case study school evaluate the functioning of the school in conjunction with parents and the members of the school board. A2 During the evaluation phase of the learning process of the project work the teacher directed attention to areas in which students were successful. A3 After the project work, the teacher gave a written assessment of each student's cooperation skills in his/her personal study-books. A4 The teaching theory underlying the teacher's practice reveals a comprehensive awareness of holistic education and constructivist learning.

6.2 Active learning and the process of change in the school

The teacher's learning process and the development of the school are closely related. Transformation of the traditional school context requires the teacher to critically reflect on his/her own principles and practices of action and to transform them, in other words, to create a new school context. From the teacher's point of view, innovations in working and the management of change involve a comprehensive learning process, where the prevailing school culture is initially internalized and, then through externalization, transformed. The learning process of the case study school teachers in the earlier traditional school culture was essentially reproductive. Thus the teachers reacted to changes in the internal and external setting of action mainly by identifying defects and correcting them. In this way the teachers preserved the models of thinking and action sustained by the school, which were based on a behavioristic conception of learning which emphasized the external control of learning. Accordingly, such single-loop learning aims at the preservation of the prevailing school practices and routines. (Cf. Argyris & Schön 1976, 19; Kauppi 1993, 79.) By contrast, a modern school culture based on progressive pedagogics which follow the constructivist conception of learning, requires transformative learning. In order to change the context of the school, the teacher needs new models of thinking and action. As a result, a change in the basis of action becomes a double-loop learning process for him. (Cf. Argyris & Schön 1976, 19; Kauppi 1993, 87.) We will next examine in more detail the reflective and transformative learning process of the teacher in the changing school culture. We will attempt to outline comprehensively the interrelationship between reproductive, reflective, and transformative learning and the way they proceed in phases during the active learning process of the teacher. Special attention will be directed towards the internalization and externalization of school culture. Figure 5 depicts the active learning process of the teacher during the process of school change.



1. Facing challenges: Problem-based work and learning
2. Analyzing practices
3. Defining new practices
4. Constructing new models for thinking and action
5. Producing new practices
6. Facing new challenges: Problem-based work and learning

FIGURE 5. The active learning of the teacher during the process of school change

1. Facing challenges through problem-based work and learning

Learning and knowledge are always linked to a context in which knowledge is learned and then used. The context of a school, its practices of action, and the school culture largely determine what is perceived as a problem, what is seen as a method, and what is understood as an acceptable solution (cf. von Wright 1993, 18). The process of change in the small rural case study school proceeded inductively in phases, by means of the teacher's practical experiences and from the discussions arising from those experiences. The aspiration to discontinue the fragmented teaching practices which encouraged passive learning and to adopt instead a holistic and activity-oriented school culture, created the basis for the teacher's problem-oriented work and for a learning process that has lasted for several years. (FIGURE 5.) The contradictions between the prevailing practices and new challenges motivated the teacher in planning the comprehensive process of change at the school. Gradually, new models of thinking were also reflected in the practices of the school. The practices of the case study school were based primarily on the pragmatist conception of man, according to which the learner is regarded as an active-minded and inquiring individual engaged in a continuous process of problem solving.

2. Analyzing current practices

People do become competent at various tasks and in various fields by gradually internalizing already invented knowledge and procedures. A developmental cycle of expert activity begins with an almost exclusive emphasis on internalization. (Engeström 1992, 15-17.) The teachers in the case study school had internalized the behavioristic models of thinking and action, prevalent in the traditional school culture, during the course of their teacher training. This internalization process was further enhanced by experiences gained in working life. Critical reflection and analysis of problems that arose from the practices of action nevertheless lead the teachers towards the innovative development of school work and towards a search for new solutions. (FIGURE 5.)

3. Defining new practices

Creative externalization occurs first in the form of discrete individual deviations and innovations. As the disruption and contradictions of an activity become more demanding, internalization increasingly takes the form of critical self-reflection, and then the process of externalization, a search for novel solutions, increases. (Engeström 1992, 15-17.) According to the expansive learning theory the direction of the transformation of learning and practices of action is built around the zone of proximal development. This zone of proximal development is the area between the established, contradictory mode of action and a qualitatively novel mode of action which offers solutions to the contradictions. (Kauppi 1993, 90.) The zone of proximal development in the case study school can be examined on two levels. The lower level of change in instructional practices is determined by the teacher's independent resources in developing the school. The higher level of change is brought about by the amount of positive support encouraging the teacher. Such support is offered by persons closely connected with the functioning of the school, including students, other teachers, parents, and administrators. The zone area which lies between these levels represents the development possibilities of the school. The zone of proximal development of the case study school was expanded by many external factors. The change process was accelerated by the renovation of the school building, in the planning of which the new instructional practices of the school culture were also outlined. The teachers wanted to develop their teaching in a more comprehensive and action-oriented direction. These new models of action, in turn, required the implementation of many changes in the curriculum, task structure, learning and teaching processes, and assessment. The new national educational policy provided favorable starting points for these activity. (FIGURE 5.)

4. Constructing new models for thinking and action

Externalization reaches its peak when a new model for the activity is conceived, designed and implemented (Engeström 1992, 15-17). The adoption of new models for thinking and action was essential in the shift away from the traditional learning context in the case study school. The transformation of the prevailing school culture

by means of externalization demanded a process of double-loop learning from the teacher. This double-loop learning emphasizes the identification and solution of those problems connected with school culture that require transformation of action principles. (Cf. Argyris & Schön 1976, 19; Kauppi 1993, 87.) The teacher in the case study school sought to acquire new models of thinking and action by studying and also by acting as an educator himself in teacher in-service training. (FIGURE 5.)

5. Producing new practices

The first result of the transformative learning process was the adoption by teachers of topic units. This presupposed a transformation of the teaching culture by opting for an activity-oriented approach. The teacher's holistic approach and the emphasis placed on activity-orientation arose from the fact that these aspects were in a dialectical relationship in the teacher's work. The teacher had to understand the multifarious connections between activity-orientation and a comprehensive approach to knowledge in practice, and then include this experiential knowledge into his own model of thinking and action. The combination of holistic education with activity-oriented learning produced new challenges in the school culture. The internalization and externalization of these challenges initiated a new learning process in the continuing shift of the school towards active learning. (FIGURE 5.)

6. Facing new challenges

As the new model becomes consolidated, internalization of the way it operates becomes the dominant form of learning and development. In this framework learning involves designing, implementing and mastering the next developmental stage of the activity system itself. (Engeström 1992, 15-17.) The change process of a school is a continuum, where answers are sought to questions perceived as significant. At its best, the active learning of the teacher consists of independently solving of problems arising from the everyday life of the school, and of actively accessing knowledge and skills for the construction of new models for thinking and action. (FIGURE 5.) The future aim of the case study school is to increase the interaction between the school and the environment. This trend creates new

challenges for the teachers and students in developing their active learning in the direction of authentic learning. Activeness however does not have, according to von Wright (1993, 12-13), an inherent pedagogical value. The essential issue is, what is done, and what part this plays in the overall learning process.

6.3 Assessment of the research methods

The present case study research follows the research design that was jointly constructed by researchers participating in the OECD/CERI Active learning - research project. Correspondingly, the disposition cooperatively produced by the researchers describing active learning by students and by teachers was employed in the collection of the data. The classification was further specified and deepened by means of interviews and observations. As a research method, a case study, realized in a natural context, was very suitable for an accurate and profound analysis at the school level.

The research was implemented during an intensive observation period lasting for one week. Documentation material was collected and the teachers were interviewed also prior to the observation week. It is possible that prolongation of the observation period might have thrown more profound light especially on the strengths and problems of active learning by students and by teachers. However, the trustworthiness and authenticity of the research are based, above all, on the validity of the data and the conclusions (cf. Creswell 1994, 157-158). The data should reflect the informant's thoughts. The authenticity of the data depends on the intersubjective consensus between the researcher and the informants. (Cf. Syrjälä, Ahonen, Syrjäläinen & Saari 1994, 152-154.)

In this study we sought to ensure the authenticity of the data by creating a confidential and relaxed atmosphere in the interview situations. The teachers were given time to develop their ideas in peace. Both teachers had worked at the school for a long time and were thus very familiar with the special features of their school. Furthermore, the teachers read the manuscript of the study and commented on it.

We also sought to prove the accuracy of the conclusions based on the interviews and observations by including numerous transcribed quotations in the research report. The observations and generalizations drawn from the data were coupled with the theoretical set of concepts, according to the research problems. The drawing of conclusions was, however, only continued up to the point where interpretation was possible with the applied method.The trustworthiness of the research was also increased by the triangulation principle that was followed in the collection of the data and in the drawing of conclusions.

6.4 Recommendations

The new national educational policy in Finland supports educational practices based on active learning. The main principles of the curriculum reform currently being implemented in this country support a school culture which lays stress on the autonomous control of learning and encourages flexibility and interactiveness in the school. How can these principles be transferred into teachers' models and practices of action? Will school culture change in reality? On the basis of our research findings, we have the following recommendations for policy at national level, for individual schools and for pre- and in-service teacher education.

In the future Finnish schools will change and develop in diverse ways. The development work of the school-based curricula continuously requires new information about successful models and practices of action in rural and urban schools. It is however no longer possible to collect reliable contemporary data for schools by means of extensive surveys. In their development work schools need qualitative and contextual information, which can be best acquired from school-based case studies (cf., for example, Stake 1994, 240-242). Teachers should be effectively informed as to the results of such research.

Methods of work and action based on active learning have many positive implications in the school context. In order to make active learning a reality in the

everyday life of Finnish schools, the following areas should be promoted in the teaching and learning practices of schools:

1. Goal setting. The educational goals of the school should be constructed and the school work should be planned increasingly in cooperation with students and their parents.
2. Task structuring. The amount of project work carried out by small groups and based on the principles of cooperative learning should be increased in school work.
3. Accessing of information. Students should be encouraged to access information from range sources and by diverse methods both in and outside school.
4. Processing of work and learning. During the project work of small groups special attention should be paid to the development of thinking skills and social skills. Connections between all interest groups of the school should be actively formed and maintained.
5. Utilizing the outcomes of work and learning. Educational products should also be utilized for purposes other than the promotion of learning. Schools should develop close interactive relationships with the surrounding community.
6. Assessment procedures. In addition to self-assessment, students should be directed in the self-assessment of small group activity. In the assessment, not only the achievement of cognitive objectives, but also the development of students' metacognitive skills should be taken into consideration.

One important task of teacher education is to develop forms of teaching which offer the trainees an opportunity for constructing internal models of action. Teacher trainees connect different theories of learning and teaching to these models of action, which they later utilize in their teaching work. During the continuous formation of models of action an essential role is played by experiences gained in practical teaching work and by critically reflecting on them. The goal is to learn strategies which change school practices by means of transformative learning. Teaching practice should consist not only of classroom training; future teachers need to get

comprehensively acquainted with the contextual factors of schools. (Cf. Kalaoja 1991, 119-121; Kalaoja & Pikkarainen 1993, 147-156.) The experiences of teachers in working life as implementors of the new curriculum should be utilized in teacher education. Information gained from case studies about the successful teaching practices of schools should be transmitted to the pre- and in-service training of teachers. Teachers should also increasingly be provided with the opportunity of reflecting in small groups on their own experiences in the process of school change.

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APPENDIX 1

QUESTIONS FOR TEACHER INTERVIEW ABOUT STUDENTS' ACTIVE LEARNING

CERI Comparative Study of Active Learning

Student involvement in setting goals

Do you involve students in setting goals? How? Do you talk with students about how their learning goals and activities relate to a context outside of school? How do you find out what students are really interested in?

Task structure

Are students involved in deciding what task activities to engage in? Do they decide individually, in small groups, or as a whole class?

Are they involved in deciding whether work will be done individually, in small groups, or in a whole class?

Do you ever have students working in small groups? About what fraction of the time? Within each group, do all members work on the same task? Do task assignments differ across groups? Are some tasks easier than others? Does one student´s accomplishment of a task depend on other members of the same group? Does accomplishment of one group´s task depend on members of other groups? If students have different tasks, how are they assigned? How is group membership determined? How long to students remain in the same groups? Are groups expected to work together outside of class time? Are they given homework to do as a group?

Are students given incentives other than grades or marks? What incentives? Do students' grades or other rewards depend on the performance of other students? How?

Accessing information

Within the classroom, are students usually exposed to new information individually, in small groups, or as a whole glass? Describe. To what extent does new information come in response to questions asked by students themselves? Examples?

Do students seek out sources of information other than what you provide them in the classroom. Examples? Do they use library? Do they have access to computerized data bases on CDROM or through networks? Do they obtain information relevant to your class from other staff members in the school, or from people outside the school? Examples?

Do students spend any class time away from school? Individually, in small groups, or as a whole class? Where do they go? What do they do there?

Process of work and learning

When you are teaching the class as a whole, how do you encourage students to ask questions? How do they make sure they understand?

If you have students work in small groups, how do you prepare them to be effective team members? How do they deal with conflicts or frustrations that may arise?

When students are working individually, how do they monitor their own work to make sure they are doing it correctly and well?

About what fractions of the time are you the center of attention in class?

Do students generate, explore, and test hypotheses on their own?

Outcomes of work

Is the product of students' work used for some purpose in addition to promoting students learning? By whom? If not, could it be used potentially?

Assessment of learning and learning process

Do students themselves assess what they have learned? In cognitive, affective, social domains? Do students learn things that could not have been predicted ahead of time? Do students assess one another's learning? If students work in small groups, how is each member's individual contribution assessed?

Do you review students' self-assessments? Do you discuss them with students?

Are performance standards defined by students, individually or collectively? Do students reflect on their performance relative to the standards, and discuss how to improve?

Do students discuss how the task structure or learning process might be made more effective? If they work in small groups, do they evaluate how well the groups functioned?

Are the methods of teaching and learning in this class similar to most other classes in this school, or are there only a few teachers who use methods like these, or are you the only one? If you are the only one, or one of a few, how are these methods viewed by other teachers, administrators, parents? If students' experience in your class differs from their other classes, how do they deal with the transitions back and forth?

APPENDIX 2

QUESTIONS FOR TEACHER INTERVIEW ABOUT TEACHERS' ACTIVE LEARNING

CERI Comparative Study of Active Learning

Involvement in setting goals

During the current or previous school year, have you been involved in introducing any new teaching methods or materials in your classroom? Please describe. Who initiated these efforts? What was your own role in taking this initiative? What was the role of other teachers? Administrators? Others?

Task structure

Once the decision was made that you would learn something new, who decided how the learning activity would be organized? How are decisions made about release time, meetings, use of the school's budget for staff development, or work during the summer? Are other teachers, administrators, or others involved in decisions that affect you? How are your learning activities tied to shared teaching responsibilities, if any? Describe.

During the current or previous school year, what are the most significant professional development activities in which you have participated? What was significant about them? When and where did these activities take place? Who else was involved?

What are the main motivations for you to learn new teaching methods or develop new materials? Are there any external incentives?

Accessing information

What are your main sources of information for developing new teaching methods or materials? Give specific examples, if any, of information obtained from other teachers in the school, administrators, in-service activities, courses or conferences, friends or networks outside the school, community members, professional journals or other publications.

Process of work and learning

What is the most significant change in your teaching that you have made in the current or previous school year? What was significant about it? How did you find out about the new practice? How did you decide you were ready to make this change? Did anyone else participate in your decision? What kind of support, if any, did you receive? Was this change related to any of the professional development activities you described earlier?

Does your method, style, or philosophy of teaching differ from other teachers in this school or district? If so, how is your way of teaching perceived by other teachers, and by administrators and parents?

Outcomes

In addition to yourself and your students, do other teachers in this school or any other colleagues benefit from hearing about what you have learned and the changes you have made?

Are you and your students engaged in projects that benefit the community in any way?

Assessment of learning and learning process

How do you assess the effects of new teaching practices or materials on students? Are any assessment criteria given to you, or do you develop your own? Cognitive, affective, social? Short-term results in class, or long-term results (e.g., examinations)? Do you work with other teachers on this? Do you discuss how to improve the results?

Thinking about the changes you have made during the present or previous school year, were the results what you expected? Did you learn anything that surprised you? Please explain.

Has your theory or philosophy of education changed in the past year or two? How?

Is there any assessment of the process by which you and other teachers in your school learn to develop new teaching methods and materials. Please describe. If you work with other teachers, do you discuss how your teamwork could become more effective?

APPENDIX 3

QUESTIONS FOR STUDENT INTERVIEW ABOUT ACTIVE LEARNING

CERI Comparative Study of Active Learning

Involvement in setting goals

Does the teacher ever ask you what you are interested in learning? Do you ever talk about what you are going to learn, and why? Do you have choice about what you learn?

Task structure

Do you ever get to decide how learning activities will be organized? Do you get a choice of activities?

About what part of the time do you work as a whole class, in small groups, or as individuals?

If you work in small groups, does everyone in the group do the same thing? Does every group do the same thing? Does your work depend on what other students do? How are groups chosen? How long do they stay together?

Are you given homework to do as a group?

Do students receive rewards other than grades or marks?

Accessing information

In class, do students mainly get new information as a whole class, in small groups, or individually?

Do you ever have to look for information other than what you get from the teacher, the textbook, or other materials the teacher gives you? Do you get information you need for school from the library, CDROM or computer network, or from people outside of school?

Process of work and learning

When your teacher is explaining something, are you encouraged to ask questions? Are you allowed to say that you disagree with the teacher? If you work in small groups, what happens if team members cannot agree about something? When you work by yourself, how do you know you are doing the right thing?

Do you ever get to spend time in school trying to find the answer to a question that you asked yourself? For example?

Outcomes of work

Is the product of your school work ever used for anything, besides helping you to learn? If so, by whom? If not, could it be used by someone, potentially?

Assessment of learning and learning process

How do you know what you have learned from school activities? Are students ever involved in checking one another's work? Do you ever talk with other students about how you could all learn more?

Do the methods of teaching and learning in this class differ from your other classes? How? Which do you prefer? Why? Is there a problem for you in going from one way of teaching to another?

Current national educational policy in Finland supports educational practices based on active learning. The central features of Finnish curriculum reform emphasize a school culture with personal control of the learning process and a general flexibility and interactiveness in the functioning of the school. How can these principles be transformed into models of action and teaching practice? Does school culture change in reality?

The purpose of the Teachers and Students as Active Learners international reseach project, initiated by OECD/CERI, was to compare the active learning process of students and teachers as revealed in the educational practices of seven countries. The study examined active learning, its goal setting, task structuring, information access, the process of working and learning, how outcomes of work and learning are utilized, and assessment procedures. This case study looks at active learning in one small rural school in Finland.

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